

The LADIES' Diary  
OR  
WOMAN'S ALMANACK,  
For the Year of our LORD 1782;  
Being the Second after BISSEXTILE, or LEAP-YEAR.  
Containing New Improvements in ARTS and SCIENCES,  
And many Entertaining PARTICULARS:  
Designed for the Use and Diversion of the  
FAIR-SEX.

The Seventy-ninth ALMANACK Published of this Kind.



VIRTUE and SENSE, with FEMALE SOFTNESS join'd,  
(ALL that subdues and captivates Mankind!)  
In BRITAIN's Matchless FAIR resplendent shine;  
THEY rule LOVE's Empire by a Right Divine:  
Justly their Charms the astonish'd World admires,  
Whom R<sup>E</sup>AL CHARLOTTE's bright Example fires.

Printed for the COMPANY of STATIONERS,  
And sold by JOHN WILKIE, at their Hall in Ludgate-Street.

[Price, stitched, NINE-PENCE.]

CHRONOLOGY OF REMARKABLE EVENTS.		
Yrs. Christ.	Yrs. since.	Yrs. since
1600 King Charles I. born -	182	
1603 Q. Eliz. died, K. Ja. succ.	179	
1603 A great Plague in London	179	
1605 Popish Gun-powder Plot -	177	
1616 Shakspere the poet died	166	
1625 K. James died, Cha. I. succ.	157	
1641 Bloody Irish massacre -	141	
1642 Sir I. Newton born, Dec. 25	140	
1649 K. Charles I. beheaded -	133	
1658 Oliver Cromwell died -	124	
1660 K. Charles II. restored -	122	
1662 Royal Society instituted	120	
1665 Died of the plague 68,586	117	
1666 Great fire in London -	116	
1666 War against Denmark decl.	116	
1667 Peace with Hol. Fr. & Denm.	115	
1672 War against Holland decl.	110	
1672 Halfpence & Farth. coined	110	
1674 Peace with Holland procl.	108	
1679 Habeas Corpus act passed	103	
1685 K. Cha. II. died, Ja. II. succ.	97	
1688 Prince of Orange landed -	94	
1688 K. James II. abdicated -	94	
1689 Wm. and Mary crowned	93	
1693 Hackney coaches established	89	
1702 K. Wm. died, Q. Ann succ.	80	
1702 War against France declared	80	
1707 England & Scotland united	75	

BIRTH-DAYS [Etc.] and YEARS of the ROYAL FAMILY OF GREAT BRITAIN.		
KING GEORGE III. June 4, 1738		
Prince of Wales, August 12, -	1762	
Prince Frederick, August 16,	1763	
Prince William Henry, Aug. 21,	1765	
Prs. Charl. Aug. Mat. Sept. 29,	1766	
Prince Edward, Nov. 2, -	1767	
Prs. Augusta Sophia, Nov. 8, -	1768	
Prs. Elizabeth, May 22, -	1770	
Prince Ernest Augustus, June 5, 1771		
Prince Aug. Fred. Jan. 27, -	1773	

YEARS of BIRTHS of the PRINCIPAL SOVEREIGNS of EUROPE.		
Cha. Frederick, King of Prussia, 1712		
Achmet IV. Grand Seignor -	1715	
Charles, King of Spain, -	1716	
Pius VI. Pope - - -	1717	
Victor Amada Maria, K. Sardinia	1726	
Catherine, Empress of Russia,	1729	
Stanislaus Aug. King of Poland	1732	

N° 79. January hath xxxi Days.

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Last Quarter, 6th, 39 m. past 10 night.  
 New Moon, 13th, 40 m. past 6 night.  
 First Quarter, 21st, 45 m. past noon.  
 Full Moon, 29th, 46 m. past 8 morn.

Sun enters ♎  
 19d. 7h. 52m.

1 Tu	Circumcision	8	5	3 55	22 59	5 a 37	17
2 W		4	56		54	6 59	18
3 Th		3	57		48	8 20	19
4 F		3	57		42	9 43	20
5 S	Old Christmas Day	2	58		35 11	7	21
6 F	S. aft. Christ. Epiph. 12th D.	1	59		28 morn		22
7 M	Plow Monday	0	4	0	20 0	30	23
8 Tu	Lucian	7	59	1	12 1	57	24
9 W		58	2		3 3	24	25
10 Th		57	3 21	54	4 54		26
11 F		56	4	45	6 22		27
12 S	Old New-Year's Day	55	5	35	7 32		28
13 M	S. aft. Epiphany Hilary	54	6	25	Q sets	N	
14 M	Off. and Cam. T. beg.	53	7	14	4 a 37		1
15 Tu		52	9	3	6 2		2
16 W		51	10 20	52	7 23		3
17 Th	Old Twelfth-Day	49	11	40	8 38		4
18 F	Q. Ch. Birth-d. kept. Prisca	48	13	27	9 51		5
19 S		47	14	15 11	1		6
20 M	Sun. aft. Epiph. Fabian	45	15	2	morn		7
21 M	Agnes. Hilary 1st Ret.	44	17 19	48	0 12		8
22 Tu	Vincent	42	18	35	1 23		9
23 W	Hilary Term begins	41	20	21	2 35		10
24 Th		39	21	6	3 49		11
25 F	Conversion of St. Paul	38	23 18	51	5 0		12
26 S		36	24	36	6 4		13
27 M	Septuages. S. Pr. Aug. F. b.	35	26	21	6 58		14
28 M	Hilafy 2d Return [1773]	33	27	5 7	37 15		
29 Tu		32	29 17	49	Q rises	F	
30 W	K. Cha. I. hehead. 1649	30	31	32 5 a 54	17		
31 Th		28	32	15 7	20 18		

Days	L. of D.	Day Inc.	D. break	Tw. ends	Sun Ealt	Cl. bef. S.	7 Stars So.
1	7	50	0 6	5 59	6 1 4 41	4' 15"	8 a 43
6	57	13	57	3	43	6 31	21
8	7	23	54	6	48	8 35	7 59
6	19	35	49	11	49	10 25	38
6	32	48	44	16	53	11 57	17
6	47	1 3	38	22	57	13 8	6 55

Last Quarter, 5th, 38 m. past 6 morn.  
 New Moon, 12th, 48 m. past 8 morn. Sun enters ♫  
 First Quarter, 20th, 18 m. past 10 morn. 17 d. 22 h. 43 m.  
 Full Moon, 27th, 30 m. past 9 night.

W D	D D	Sundays, Holydays, &c.	Sun rises	Sun sets	Sun's Decl.	7 & rises	Age
1 F			7 27	4 34	16 58	8 a 45	19
2 S		Purif. or Candlemas-day	25	36	41	10 9	20
3 F		Sexagesima Sund. <i>Blase</i>	23	37	23	11 35	21
4 M		Hilary, 3d Return	21	39	5	morn	22
5 Tu		<i>Agatba</i>	20	41	15 47	1 2	23
6 W			18	43	29	2 35	24
7 Th			16	44	10 3	3 59	25
8 F			14	46	14 51	5 15	26
9 S		Hilary, 4th Return	13	48	32	6 13	27
10		Quinquagesima Sunday	11	50	12	6 54	28
11 M			9	52	13 52	7 2	29
12 Tu		HIL. T. ends. Shrove-Tu.	7	54	32	Q sets	N
13 W		Mid-Wed. Old Cand.Day	5	56	12	6 a 15	1
14 Th		<i>Valentine</i>	3	57	12 52	7 29	2
15 F			1	59	31	8 41	3
16 S			0 5	1	10	9 52	4
17		R. S. in Lent. Quadrages.	6	58	3 11 49	11 3	5
18 M			56	5	28	morn	6
19 Tu			54	7	7	0 16	7
20 W		Ember Week	52	9	10 45	1 28	8
21 Th			50	11	23	2 41	9
22 F			48	13	2	3 5	10
23 S		Pr. O'Savio born 1779	46	15	9 40	4 48	11
24		St. Matthias. Pr. Ad. Fr. b.	44	17	17	5 34	12
25 M		[1774: 2 S. in Lent]	42	18	8 55	6 5	13
26 Tu			40	20	33	6 31	14
27 W			38	22	10	Q rises	F
28 Th			36	24	7 48	6 a 22	16

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars So.	Days
1	9	7	1 23	5 31	6 29	5 4	14 7"	6 a 32
6	25	41	23	37	9	34		11
11	43	59	15	45	15	41	5 51	11
16	40	1	2 17	6	54	20	29	32
21	20	36	4 57	7 3	26	13 59	13	21
26	40	56	48	12	32	12	4 55	26

Last Quarter, 6th, 31 m. past 2 aftern.

New Moon, 14th, 21 m. before 1 morn. Sun enters ♈

First Quarter, 22d, 25 m. past 5 morn. 19 d. 23 h. 10m.

Full Moon, 29th, 11 m. past 8 morn.

1	F	David	6	34	5	26	7	f	25	7	a	50	17
2	S	Cbad		33		28			2	9	20		18
3	F	3 Sunday in Lent		31		30	5	39	10	51		19	
4	M			29		32		16		morn		20	
5	Tu			27		34	5	53	0	21		21	
6	W			25		36		29	1	53		22	
7	Th	Perpetua		23		38		6	3	13		23	
8	F			21		40	4	43	4	15		24	
9	S			19		42		19	5	1		25	
10	F	4th, or Midlent Sunday		17		44	3	56	5	29		26	
11	M			15		46		32	5	51		27	
12	Tu	Gregory		13		48		9	6	8		28	
13	W			11		50	2	45	6	20		29	
14	Th			9		52		21	(	sets		N	
15	F			7		54	1	58	7	a	42	2	
16	S			5		56		34	8	54		3	
17	F	5 S. in Lent, St. Patrick		3		58		10	10	7		4	
18	M	Edw. K. W. S.		1	6	0	0	47	11	20		5	
19	Tu			5	59	2		23	morn			6	
20	W				57		40	n	1	0	33		7
21	Th	Benedict			55		6		24	1	42		8
22	F	Lamb. Term ends			53		8		4	2	43		9
23	S	Opp. Term ends			51		10	1	12	3	34		10
24	F	5 S. in Lent, Palm-Sund.			49		12		35	4	11		11
25	M	Annunc. or Lady-Day			47		14		59	4	40		12
26	Tu				45		16	2	22	5	0		13
27	W				43		18		46	5	15		14
28	Th	Maundy Thurstday			41		20	3	9	5	30		15
29	F	Good-Friday			39		22		33	(	rises		F
30	S				37		24		56	8	a	29	17
31	F	Easter-Day			35		26	4	19	10	4		18

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	C1. bef. S.	7 Stars So.
1	10	52	3	8	4	43	7 17
2	11	11	27		32	28	42
3	11	31	47	21	39		10 12
4	16	51	4	7	11	49	55
5	21	12	27	0	8	0	1
6	26	31	47	3	48	12	7

Last Quarter, 4th, 8 m. past 11 night.

New Moon, 12th, 32 m. past 5 even.

Sun enters ♈

First Quarter, 20th, 54 m. past 8 even.

19 d. 11 h. 59 m.

Full Moon, 27th, 2 m. past 5 even.

1	M	Easter-Monday	5	33	6	28	4	n	42	11	a 40
2	Tu	Easter-Tuesday	31		30	5	5			morn	20
3	W	Richard	29		32		28	1		8	21
4	Th	St. Ambrose	27		34		51	2		18	22
5	F	Old Lady-Day	25		36	6	14	3		9	23
6	S		23		38		32	3		44	24
7	F	1 S. aft. East. Low-Sund	21		40		59	4		6	25
8	M		19		42	7	22	4		25	26
9	Tu		18		43		44	4		35	27
10	W	Off. and Cam. T. begin	16		45	8	6	4		44	28
11	Th		14		47		28	4		56	29
12	F		12		49		50	C	sets	N	12
13	S		10		51	9	12	8	a	1	1
14	I	2 Sunday after Easter	8		53		33	9		14	2
15	M	Easter Term, 1st Return	6		55		55	10		29	3
16	Tu	Easter Term begins	4		57	10	16	11		37	4
17	W		2		59		32		morn	5	17
18	F	Alphege	0	7	1		58	0		41	6
19	S		4	59		3	11	19	1	39	7
20	I	3 Sunday after Easter	57		5		39	2		20	8
21	M	Easter Term, 2d Return	55		6	12	0	2		48	9
22	Tu	St. George	53		8		20	3		11	10
23	W		51		10		40	3		29	11
24	Th	St. Mark. Prs. Mary bo	49		12	13	C	3		42	12
25	F		48		14		19	3		56	13
26	S	[1775]	46		16		39	4		9	14
27	I	4 Sunday after Easter	44		17		58	C	rises	F	15
28	M	Easter Term, 3d Return	42		19	14	17	9	a 10	16	16
29	Tu		40		21		35	10		44	17
30	W		39		23		54		morn	18	18

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun	East	Cl. bef. S.	7 Stars So	Days	
1	12	55	5	11	3	32	8	28	6	15
6	13	15	31	20			40		21	22
11		34	50	7			53		27	57
16	53	6	9	2	53	9	7		33	o aft. 5.
21	14	12	28	39	21		39	1	28	36
6	30		46	23			37	2	25	17

May hath xxxi Days.

N° 79

7

Last Quarter, 4th, 12 m. past 9 morn.	
New Moon, 12th, 11 m. past 10 morn.	Sun enters II
First Quarter, 20th, 7 m. past 9 morn.	zod. 12h. 37 m.
Full Moon, 27th, 29 m. before 1 morn.	

W	37	7	24	15	n	12	o	m	10	19
I <sub>H</sub>			35	26		30	1	11	0	
F	<i>Invention of the Cross</i>				33	28	47	1	50	21
S	S. aft. East. Rog. Sund.				32	30	16	5	2	22
					30	32		22	2	23
M	John A.P.L. East. T. 4 Ret.				28	33	39	2	51	24
T <sub>U</sub>			27	35		56	3	21	25	
W	Ascension. Holy Thurs.				25	36	17	12	3	26
I <sub>H</sub>			23	38		28	3	21	27	
F	Easter Term, 5 Return				22	40	44	3	32	28
S	S. aft. Ascens. Old May D.				20	41	59	3	44	29
	Easter Term ends				19	43	18	14	C sets	N
M			17	44		29	9 a	33	1	
T <sub>U</sub>			15	46		44	10	40	2	
W			14	47		58	11	37	3	
I <sub>H</sub>	<i>Off. Term ends</i>				12	49	19	12	morn	4
F			11	50		25	0	21	5	
S	Whit-S. Q. Charl. b. 1744				10	52	39	0	54	6
	Whit-Monday.				8	53	52	1	17	7
M	Whit-Tuesday Dunstan				7	54	20	4	1	8
I <sub>H</sub>	Emb. Week. Prs. Eliz. bo.				6	56		16	1	9
W			4	57		28	2	3	1	
I <sub>H</sub>			3	58		40	2	15	11	
F			2	59		51	2	27	12	
S	Trin. S. Augustine, A. B.				0	8	1	21	2	13
					3	59	2	12	3	14
M	Ven. Bede. Trin. T. 1 Ret.				58	3		22	C rises	F
T <sub>U</sub>	K. Ch. II. Ref. 1660.				57	4		32	10 a	54
W			56	5		41	11	45	17	
I <sub>H</sub>	<i>Corpus Christi.</i> [T. beg.				55	6		5	morn	18
F	Trinity Term begins				54	7		50	0	19

Davs	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun	East	Cleat S.	7 Stars So
1	14 48	7 4	2 7	9 55	6	50	3° 10"	o a 58
6	15 5	21	1 50	10 12		55	41	39
11	21	37	30	32	7	0	58	20
16	36	52	6	57	4	4	o	
21	50	8 6	30	11 40	8	3 48	11 m 41	
26	16 3	19	No Night.		12	22		21

Last Quarter, 2d, 19 m. past 9 night.

New Moon, 11th, 25 m. past 1 morn.

Sun enters  $\Sigma$ 

First Quarter, 18th, 52 m. past 4 aftern.

zod. 21 h. 21 m.

Full Moon, 25th, 32 m. past 7 morn.

1	S	Nicomedes	3	23	8	22	n	7	0	m	40	20
2	F	1 Sunday after Trinity	52	6		15	0	55	21			
3	M	Trinity Term; 2 Return	51	10		2	1	7	22			
4	Tu	K. Geo. III. born, 1753	50	10		30	1	17	23			
5	W	Pr. Er. Aug. b. 1771, Bonif.	49	11		36	1	27	24			
6	Th		49	12		43	1	37	25			
7	F		48	12		48	1	49	26			
8	S		47	13		54	2	2	27			
9	F	2 Sunday after Trinity	47	14		59	2	22	28			
10	M	Prs. Am. b. 1711, Trin. T.	46	14	23	4	2	47	29			
11	Tu	St. Barnabas. 13d Ret.	46	15		8	C sets		N			
12	W		45	15		12	10 a	18	2			
13	Th		45	16		15	10	53	3			
14	F		44	16		18	11	20	4			
15	S		44	16		21	11	38	5			
16	F	3 Sunday after Trinity	44	16		23	1	53	6			
17	M	St. Alban. Trin. T. 4 Ret.	43	17		25	morn		7			
18	Tu					26	0	5	8			
19	W	Trinity Term ends				27	0	17	9			
20	Th	Trans. Edw. K. W. S.				28	0	28	10			
21	F	Longest Day				28	0	42	11			
22	S					28	0	58	12			
23	F	4 Sunday after Trinity				27	1	23	13			
24	M	St. John Baptist				26	2	2	14			
25	Tu		43	17		25	grises		F			
26	W		43	16	23	10 a	9	16				
27	Th		44	16		21	10	36	17			
28	F		44	16		18	10	54	18			
29	S	St. Peter	44	15		15	11	8	19			
30	F	5 Sunday after Trinity	45	15		11	11	19	20			

Days	L. of D.	Day Inc.	D. breaks   Tw. ends	Sun East	Cl. aft. S.	7 Stars So.	Days
1	16	15	8 31		7 16	2' 38"	10 m 56
6	24	40	No night, but		18	1 48	36
11	29	45	constant day		19	0 51	16
16	32	48	or twilight.		20	0 b 12	9 55
21	34	50			20	1 17	34
26	23	o dec. I			20	2 20	14

Last Quarter, 2d, 46 m. past 11 morn.

New Moon, 10th, 59 m. past 2 aftern.

First Quarter, 17th, 55 m. past 10 night.

Full Moon, 24th, 21 m. past 3 aftern.

Sun enters Sc.

22 d. 8 h. 11 m.

	M	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	Tu	Visitat. V.M. Cam. Com.	46	4		3	11	40													
2	W	Dog-days begin	46	13	22	58	11	51													
3	Th	Translation of St. Martin	47	15		53		morn													
4	F	Old Mids. Day. Cam. T.	48	12		47	0	4													
5	S	Oxford Act. [ends	48	11		41	0	19													
6	F	6 S. aft. Trin. Tho. a Becket	49	11		35	0	42													
7	M		50	10		28	1	14													
8	Tu		51	9		21	1	57													
9	W		51	8		14	C sets	N													
10	Th		52	7		6	9 a	17	1												
11	F		53	0	21	5	9	38	2												
12	S	Orf Term ends.	54	5		49	9	55	3												
13	F	7 Sunday after Trinity	55	4		40	10	8	4												
14	M	Swithun	56	3		3	10	19	5												
15	Tu		5			21	10	32	6												
16	W		58	1		11	10	45	7												
17	Th		4	0	7	59	0	10	59	8											
18	F		1	58	20	49	11	19	9												
19	S	Margaret	2	57		38	11	49	10												
20	F	8 Sunday after Trinity	3	56		27	morn		11												
21	M	Mary Magdalene	5	54		15	0	32	12												
22	Tu		6	53		3	1	38	13												
23	W		7	52	19	50	C rites	F													
24	Th	St. James	9	50		37	8 a	55	15												
25	F	St. Anne, Mother of V.M.	10	49		24	9	9	16												
26	S		12	48		1	9	22	17												
27	F	9 Sunday after Trinity	13	46	18	57	9	32	18												
28	M		15	44		42	9	44	19												
29	Tu		16	43		28	9	54	20												
30	W		18	41		13	10	7	21												

Days	... of D.	Day dec.	D breaks	Tw. ends	S. in East	U. Oct. S.	7 Stars So.
1	16	29	0	5	7 19	3 20"	8 m 53
6	23	11			18	4 15	33
11	15	19	No real Night.		16	5 0	12
16	5	29			13	35	7 52
21	15	53	41		9	56	32
26	39	55	0 48	11 8	5	6 3	12

Last Quarter, 1st, 22 m. past 4 morn.  
 New Moon, 9th, 9 m. past 3 morn.  
 First Quarter, 16th, 58 m. past 3 morn.  
 Full Moon, 23d, 16 m. past 1 morn.  
 Last Quarter, 30th, 28 m. past 10 night.

Sun enters  
22 d. 14 h. 32 m.

	Lammas	4	19	7	40	17	n	58	10	a	20	22
1	I <sup>h</sup>					21	38		43	10	41	23
2	F					22	37		27	11	9	24
3	S					24	35		11	1	47	25
4	F <sup>o</sup> Sunday after Trinity					25	34	16	55	morn	46	
5	M					27	32	38	0	38	27	
6	I <sup>u</sup> Transfiguration					29	30	22	1	45	28	
7	W Name of Jesus					30	29	5	3	2	29	
8	I <sup>h</sup>					32	27	15	47	C sets	N	
9	F					34	25	30	8	a	16	2
10	S St. Lawrence. [Dog Days end					36	23	12	8	29	3	
11	F 12 S. aft. Tr. Pre. runt. b. 1737 <sup>s</sup>					37	22	14	54	8	45	4
12	M Pr. Wales no. 1702. Old					39	20	30	8	52	5	
13	Tu [Lam.-Day					41	18	17	9	6	6	
14	W					43	16	13	58	9	24	7
15	I <sup>h</sup> Pr. Fred. born 1763					44	15	40	9	50	8	
16	F 12 Sunday after Trinity					46	13	20	10	27	9	
17	S					48	11	1	11	24	10	
18	F 13 Sunday after Trinity					50	9	12	41	morn	11	
19	M					52	7	22	0	37	12	
20	Tu					54	6	2	2	4	13	
21	W Pr. Wm. Henry bo. 1765					55	4	11	42	3	33	14
22	I <sup>h</sup>					57	2	21	C rises	F	23	
23	F St. Bartholomew					59	0	1	7	a	42	15
24	S 13 Sunday after Trinity					60	58	10	40	7	55	17
25	F 14					3	56	19	8	6	18	
26	M					5	54	9	58	8	16	19
27	Tu					7	52	37	8	30	20	
28	W St. Augustine					9	51	15	8	49	21	
29	I <sup>h</sup> St. J. Bapt. beheaded					10	49	8	54	9	12	22
30	F					12	47	32	9	45	23	

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars
1	15 21	1 13	1 23	10 36	7 0	5 52"	6 m 48
6	5	29	43	15	6 55	5 27	29
11	14 48	46	2 1	9 57	50 4	47	10
16	3 2	3	19	40	45 3	53	51
21	12	22	34	25	39 2	46	32
26	13 53	41	49	10	24 1	27	14

New Moon, 7th, 22 m. past 2 aftern.

First Quarter, 14th, 19 m. past 9 morn.

Full Moon, 21st, 13 m. past 2 aftern.

Last Quarter, 29th, 1 m. past 5 aftern.,

Sun enters ♍  
22d, 10 h. 59 m.

22	1	F	14 S. aft. Tris. Giles	5	14	6 45	8n10	10 a 32	24
23	2	M	London burnt, 1666	16	43	7 49	11 33	25	
24	3	Tu		18	41	26	morn		26
25	4	W		20	39	4	0 4		27
26	5	Th		22	37	6 42	2 6		28
27	6	F		24	35	20	3 29		29
28	7	S	Enuribus	26	33	5 56	11 sets	N	
29	8	F	15 S. aft. Tr. Nativ. of V.M.	28	31	34	6 a 55		1
N	9	M		30	29	12	7 6		2
10	10	Tu		32	27	4 49	7 19		3
11	11	W		34	25	2	7 36		4
12	12	Th		36	23	3	8 0		5
13	13	F		37	22	3 40	8 35		6
14	14	S	Holy-Cross	39	20	17	9 25		7
15	15	F	16 Sunday after Trinity	41	18	2 54	10 33		8
16	16	M		43	16	21 11	55		9
17	17	Tu	Lambert	45	14	7	morn		10
18	18	W	Ember Week	47	12	1 44	1 22		11
19	19	Th		49	10	21	2 47		12
20	20	F		51	8	0 57	4 9		13
21	21	S	St. Matthew	53	6	34	11 rises	F	
22	22	F	17 S. aft. Tr. K. Geo. III. cor.	55	4	11	6 a 20		15
23	23	M	1761. Pr. Alf. b. 1780	57	2	0 13	6 31		16
24	24	Tu		59	0	36	6 46		17
25	25	W		6	5 58	1 0	7 1		18
26	26	Th	St. Cyprian	3	56	23	7 22		19
27	27	F		5	54	46	7 5		20
28	28	S	[Ch. Aug. b. 1766	7	52	2 10	8 33		21
29	29	F	18 S. aft. Tr. St. Mich. 1 <sup>rs</sup> .	9	50	33 9	27		22
30	30	M	St. Jerome	11	48	57 10	35		23

Days	1. of D.	Day dec.	D. breaks	Tw. ends	Sun Fall	C. aft S.	7 Stars So.
28	1	13 31	3 3	3 6	8 53	6 27	0 19 4 m 52
29	6	12 12	22	20	39	21	1 56 34
30	11	12 52	42	33	25	14	3 37 16
31	16	33 4	1	44	15	8	5 22 3 58
32	21	13 21	55	4	2	7 7 41	
33	26	11 53	41	6	7 52	5 56	8 50 23

New Moon, 7th, at 1 in the morn.

First Quarter, 13th, 21 m. past 4 aftern.

Full Moon, 21st, 17 m. past 6 morn.

Last Quarter, 29th, 51 m. past 10 morn.

Sun enters m

22 d. 18 h. 52 m

1	Tu	Remigius	6	13	5	46	3	20	1	2	5	24	
2	W		15		44		43		morn		25		
3	Th		17		42	4	7	1	13		26		
4	F		19		40		30	2	35		27		
5	S		21		38		53	3	58		28		
6	F	19 S. aft. Trin. Faith	23		36	5	17	5	23		29		
7	M		25		34		39	C	sets	N			
8	Tu		26		33	6	2	5	a	52	2		
9	W	St. Denys	28		31		25	6	13		3		
10	Th	Off. & Cam. T. beg. Old	30		29		48	6	44		4		
11	F	[Mic. Day]	32		27	7	11	7	27		5		
12	S		34		25		33	8	31		6		
13	F	20 S. aft. Trin. Tr. K. Edw.	36		23		56	9	52		7		
14	M		38		21	8	18	11	17		8		
15	Tu		40		19		40	morn			9		
16	W		42		17	9	3	0	42		10		
17	Th	Etbeldred	44		15		25	2	3		11		
18	F	St. Luke	46		13		47	3	20		12		
19	S		48		11	10	8	4	36		13		
20	F	21 Sunday after Trinity	50		9		30	5	49		14		
21	M		52		7		51	C	rises	F	21		
22	Tu		54		5	11	13	5	a	11	16		
23	W		55		4		34	5	34		17		
24	Th		57		2		55	6	0		18		
25	F	K. Geo. III. Acc. Crispin	59		0	12	15	6	36		19		
26	S	K. Geo. III. Procl. 1760	7	1	4	58		36	7	24		20	
27	F	22 Sunday after Trinity	3		56		56	8	23		21		
28	M	St. Simon and St. Jude	5		54	13	16	9	36		22		
29	Tu		7		52		36	10	53		23		
30	W		8		51		56	morn			24		
31	Th		10		49	14	16	0	12		25		

Days	L. of D.	Day dec.	D. breaks	Tw. ends	Sun. East	Cl. ait. S.	7 Stars	Days
- 1	11	33	5 1	4 18	7 42	5 50	10 27	3 m 5
6	14	20	29		31	44	11 57	2 47
11	10	55	39	39	21	37	13 17	28
16	35	59	49		31	14 24		9
21	16	6 18	58		1	25	15 18	1 51
26	9	57	37	5 7	6 52	19	15 55	30

New Moon, 5th, 15 m. past 11 morn.  
 First Quarter, 12th, 20 m. past 2 morn. Sun enters ♫  
 Full Moon, 20th, 26 m. before 1 morn. 21d. 15h. 3m.  
 Last Quarter, 28th, 57 m. past 2 morn.

	All Saints	7	12	4	4	4	35	1 m	34	26
24	S. Pr.Edw.b.1767. All Souls	14	4			54	2	56		27
25	F. 23 S.aft. Tr. Pr. Soph. b.	16	43	15	13	4	22			28
26	M. [1777. Mic. T. 1 Ret.	18	42			32	5	52		29
27	Tu Powder Plot	19	40			50	C sets		N	
28	W. Mich. Term beg. Leonard	21	38	16	8	4	a 42		1	
29	Th Duke of Cumb. b. 1745	23	36			26	5	22		2
N	F. 1st Aug. Soph. b. 1768	24	35			43	6	18		3
1	S. Ld. Mayor's Day at Lond.	26	33	17	0	7		35		4
2	E. 24 Sunday after Trinity	28	31			17	9	2		5
3	M. St. Martin	29	30			34	10	29		6
4	Tu Mic. Term, 2 Return	31	28			50	11	52		7
5	W. Britains	33	27	18	6		morn			8
6	Th	34	25			22	1	10		9
7	F. Macbutus	36	23			37	2	25		10
8	S.	37	22			52	3	38		11
9	E. 25 S. aft. Trin. Hugb	39	20	19	7	4	51			12
10	M. Mich. Term, 3d Return	40	19			22	6	3		13
11	Tu	42	17			36	7	13		14
12	W. Edmund	43	16			49	C rises		F	
13	Th	44	15	20	2	4	a 33			16
14	F. Cecilia. Old Mart. Day	46	13			15	5	17		17
15	S. St. Clement	47	12			28	6	13		18
16	F. 26 Sunday after Trinity	49	11			40	7	20		19
17	M. D.Gloso. b. 1743. Mich.	50	9			52	8	33		20
18	Tu [T. 4th Ret.	51	8	21	3	9	52			21
19	W. Michaelmas Term ends	52	7			14	11	8		22
20	Th	54	6			25	morn			23
21	F. St. Andrew	55	5			35	0	27		24
22	S.	56	4			45	1	48		25

Days	L. of D.	Day dec.	D. breaks	Tw. sun	Sun East	1. East. S.	7 Stars So.
5	9 35	6 59	5 17	6 43	5 13	16 14"	1 m 9
47	6 17	7 37	23	37	7	16 8	0 49
28	11 1	33	30	30	2	15 41	29
9	16 8	45	36	24	4 57	14 53	8
51	21 30	8 4	42	18	53	13 45	11 3 43
30	26 17	17	48	12	49	12 16	22

New Moon, 4th, 20 m. past 9 night.  
 First Quarter, 11th, 1 m. past 4 aftern.  
 Full Moon, 19th, 39 m. past 7 even.  
 Last Quarter, 27th, 24 m. past 4 aftern.

Sun enters  $\frac{1}{2}$   
 21 d. 3 h. 23 m.

1	F	Advent Sunday	7	57	4	3	21	54	3 m 12	26
2	M			58		2	22	3	4	40
3	TU			59		1		12	6	15
4	W			8	0	0		20	C sets	N
5	TH					1	3	59	27	3 a 52
6	F	Nicholas			2			35	5	5
7	S				2		57	41	6	30
8	F	2S. in Advent. Concep. V.M.			3		57	48	7	59
9	M				4		56	54	9	26
10	TU				5		55	59	10	49
11	W				5		55	23	4	morn
12	TH				6		54	9	0	4
13	F	Lucy			6		54	13	1	17
14	S				6		54	16	2	30
15	F	Sunday in Advent			7		53	19	3	41
16	M	O Sapientia. Cam. T. ends			7		53	22	4	55
17	TU	O pf. Term ends			7		53	24	6	8
18	W	Ember Week			8		52	26	7	17
19	TH						allowing 9m. 5f.	27	C rises	F
20	F							28	3 a 55	16
21	S	St. Thomas. Shortest Day						28	5	0
22	F	4 Sunday in Advent						28	6	13
23	M							27	7	29
24	TU							26	8	45
25	W	Christmas Day			8		52	25	10	1
26	TH	St. Stephen						23	11	17
27	F	St. John						20	morn	23
28	S	Innocents						17	0	38
29	F	8 Sunday aft. Christmas						14	2	0
30	M							10	3	29
31	TU	Silvester						5	5	1

Days	L. of D.	Day dec	D. breaks	Fw. ends	Sub. aft	Cl. aft. S.	7 Stars So.
1	8	6	8	28	5	54	6
6	7	57		37	57	3	43
11	50		44		59	1	41
16	46		48	6	0	0	40
21	44		50		1	59	40
26	46	coinc. 2		0	6	0	40

CHRONOLOGICAL		NOTES, &c. in 1782.	
Dominical Letter	5	Shrove-Tuesday	Feb. 22.
Golden Number	16	Easter-Day	March 31.
Epact	15	Whit-Sunday	May 19.
Cycle of the Sun	27	Trinity-Sunday	May 26.
Roman Indiction	15	Advent-Sunday	Dec. 3.

## ECLIPSES, &amp;c.

THERE are 4 eclipses this year, 2 of the sun, and 2 of the moon, but only part of one of the sun visible here.—I. The moon is eclipsed, invisible, on March 29, about our 8 o'clock in the morning.—II. The sun is eclipsed, visible, on April 12; begins on the right-hand side of the sun's lower limb, at 6 h. 13 m. afternoon; but the sun sets at 6 h. 49 m. which is before the middle of the eclipse.—III. The moon is eclipsed Sept. 21, from 1 h. 20 m. to 3 h. 28 m. morn. which is long before the moon rises.—IV. The sun is eclipsed Oct. 7, about 1 in the morn. B

Besides these, there is a transit of Mercury over the upper part of the sun's disc, from left to right, on Nov. 12, Mercury appearing like a black spot, but so small, that some sort of a telescope will be necessary for viewing the transit. B is the beginning, at 2 h. 51 m. and E the end, at 4 h. 13 m. afternoon.



VENUS is an evening star to March 20, and then a morn. star to the end.  
JUPITER is a morn. star to June 15, then an even. star to the year's end.

## ANSWERS TO THE ENIGMAS.

- |                  |                  |                       |                  |
|------------------|------------------|-----------------------|------------------|
| 1. The letter W. | 4. Arrow.        | 7. Happiness.         | 10. Light.       |
| 2. Miss.         | 5. Strong Beer.  | 8. Longest & Sh. Day. | 11. King's Arms. |
| 3. Egg.          | 6. The letter O. | 9. Ladies' Diary.     | Pr. Whisper.     |

Pr. Enig. ans. by Mrs. Rubwell, in a WHISPER to Dr. Conundrum.

Good Doctor Conundrum, a word in your ear,  
Why, Miss Peggy Lugg was quite silent last year!  
\* 'Tis whisper'd—she's false; then forget the ingrate;  
And if you are really in want of a mate,  
Another as witty, as excellent, fair,  
Admires your soft numbers, so do not despair;  
But cheer up, Old Buck, and by the next year,  
The name of this fair one you'll certainly hear.

## The same answered by Amintor.

Alas friend Dil! poor whisp'ring lady, Tho' he's with another toying,  
Is your voice so feeble grown? None but you can fix the swain;  
Will you faint and die already? Soon he'll back to you be flying,  
Fy! take courage, Co's not flown. Soon you'll clasp your love again.

\* We can hardly credit the insinuation here thrown out by Mrs. Rubwell, but must think she has been mis-informed concerning the frailty of Miss L. whose known constancy and excellent virtues will not permit us to attribute her silence to any other cause than either death or some severe indisposition.—In case of the worst, however, we shall expect the accomplishment of the fair Incognita's promise here made by Mrs. Rubwell, as we are not quite without hopes that our worthy doctor, notwithstanding his great antiquity, and excellent constancy, may not be altogether insensible to the tender and affectionate services of another fair hand to rub his bald pate. The EDITOR.

**The Prize Enigma answered by Miss Polly Milthorp.**

I've often strove your prize to gain,  
As often wish'd and hop'd in vain,  
And still pursue the bait;

| Tho' something *wispers* in my ear,  
That maids more witty, rich, or fair,  
Are, Sir, more fortunate.

**Mrs. B. of Salisbury thus answers it.**

A *Wisper*, its effects how strange !  
The warmth of friendship soon 'twill  
change,  
'Twill anger's fiercest storms appease,  
The sinner's full-swoln bosom ease.

| When flatt'ry tries its wily arts,  
Ye harmless virgins, guard your hearts;  
When breath'd from fearful Damon's  
breast  
In tender love, the Maid how blest !

**The same answered by Miss Sarah Blackneck.**

Permit a friend you little guess  
To *wisper* in your ear,

| And ask, if this deserves the press,  
Ten Diaries next year.

**Mr. John Stafford, of Bingham, thus answers it.**

Winter is gone, the smiling flow'rs appear,  
And hark ! the spring awakes the  
tuneful grove ;  
Favonius *wispers* soft in Flora's ear, Now, goddess, is the gentle reign of love.

**Mr. W. Allison's Answer.**

As with my fair I chanc'd to walk,  
A spy o'erheard our am'rous talk ;  
Cries Cloe, softly—hift, Sir !—

| Pray why, my dear ? since I'm with you,  
I must and will my tale pursue ;  
Then pray, Sir, only *wisper*.

**Marcus thus answers the same.**

The prize enig. I must confess,  
Is crooked as its writer S ;

| But, hit or miss, here goes, I'll try't—  
*Hark in your ear*, Sir—am I right ?

**The same by Richard Dening.**

For twenty long years I've been suing the fair, And yet, like Conundrum,  
a batch'lor appear :  
So find by experience long courtships are vain, Unless by a *wisper* a lady I gain.

**Miss Diana Browne, of Honiton, thus answers it.**

The prize this year, I think's a *wisper*, | So I remain your loving sister.

**The same by Eugenio.**

Ye tempests cease—and let the balmy breeze Breathe in soft *wispers*  
thro' the trembling trees ;  
Let each blithe bird attune his sweetest lay, To hail fair Leonora's natal day.

**Mr. Robert Richardson's Answer.**

How happy was Damon, when first in yon grove, To Phillida's cottage he  
went ;

| sweetly *wisper'd* consent.

When in rapturous accents the youth breath'd his love, And the nymph

We are truly sorry that our limits will not include more of the ingenious answers given by Misses E. A. Anderson, Ashburner, Baxter, Bayley, Bonner, Branby, Brooks, Miss Cooke of Tinsley, Miss Hannah Coward, Crane, Crepmouse, P. D. Dees, P. E. Eaton, Eland, Miss Polly Empson, Finney, Franks, Miss Maria G. H. J. H. Habgood, Hail, Harper, Harris, Hartley, Hebe, Jackson, Juvenis, Keeling, Keith, Mrs. Lean, Lodge (formerly Cælebs) Marks, Oliver, Orestes, Miss Eliza P. Patterson, Philander, Philomena, Miss Peggy R —n, Rainbolt, Rebsur, W. Richardson, Miss Polly Ridler, Robert, Rusber, Rubiculus, Miss Betty Smale, Smæb, Spry, W —s, Mrs. Amelia, Stanhope, Kit Went, William Woolver, and Yam.

## The ENIGMAS answered by Dr. Conundrum.

When our antediluvian forefathers woo'd,  
Half a cent'ry elaps'd ere the nuptials ensu'd :  
Nor had they much cause to be sparing of time,  
When a girl of one hundred was just in her prime;  
And a sWain was ne'er reckon'd too ancient to wed,  
Tho' five or six ages had pass'd o'er his head.  
But now that our vigour so quickly decays,  
And women at forty have seen their best days,  
In prudence, each moment we ought to employ,  
And catch, while we're able, the fugitive joy.  
With no small concern, 'then, my own case I view,  
Who with sighs and with verses fair Peggy pursue ;  
For when I reflect how our minutes must fly,  
While one year she writes, and the next I reply,  
I am fearful, if e'er we should marry, I vow,  
I shall find her as old, as I find myself now,  
Then, O ! how the neighbours will gather, to see  
Such a pair of antiques as, I doubt, we shall be !  
And when to the temple, amid the vast throng,  
On our wooden SUPPORTERS we hobble along,  
What winks, and what WHISPERS, what gibes, and what jeers, Pr.  
Will on each fide assault both our eyes and our ears !  
Yet think not my love with her bloom shall decay,  
Or that age shall my HAPPINESS greatly allay :  
Tho' time, with rude hand, all her charms shall impair,  
Her faithful Conundrum shall still think her fair :  
Tho' her eye shall grow dim, and her roses shall fade,  
In my ARMS I'll encircle the sweet wither'd maid ;  
The ruins of beauty with rapture I'll trace,  
And KISS the dear wrinkles that furrow her face.  
Yes, still shall my REED be attun'd to thy praise,  
Thou LIGHT of my life, and soft theme of my lays ;  
And in spite of grey heirs, in my mind and my song,  
Thou shalt ever be charming, and ever be young.  
Thy presence my cares and my pains shall beguile,  
And make me, with all my infirmities, smile :  
Tho' rack'd by the gout, when my Peggy is near,  
The LONGEST of DAYS shall the SHORTEST appear.  
With wonder our singular tale shall be read,  
Wherever the works of DIARIA shall spread ;  
And to ages remote in our loves shall be shown  
A brighter example than Darby and Joan.

The same answered by the Rev. Mr. Tho. Baker.

Celestial muse, your choicest pow'r's Dayly assistance for the helpless poor.  
display, Permit my brief your royal arms to  
Tune with poetic eloquence my lay; wear,  
Aid me in smoothest numbers to And Lady D'ry, with indulgent care,  
implore,

Will soon convey its with a pleasing smile, [fav'rite isle.] Their only *happiness*, their earthly bliss, [ing *bliss*; From house to house thro' Britain's Now ladies, to my cause for ever true, Seem now concert'red in the part- Excuse my freedom, I'll begin with you: Round the sick parents, see the hungry train, [in vain, You whose kind bosoms with com- Cold and half naked, weep for bread passion glow, [woe; Indeed to name each scene of their Whose lift'ning ears attend to tales of distress, [oppress. Tho' in circle gay, or at the ball, Dear ladies, wou'd your tender hearts In splendor shine, you'll bear the Ye then who often feast on roast sur- needy's call. loins, [and wines, Go to the cottage, cast soft pity's eye Into the chearless huts of poverty; Amidst your music, mirth and jollity, Whose tott'ring walls, with rage Think of the wretched poor in misery; nail'd here and there, [ing air. Clothing and med'cine, food and fuel Admitting light, admit the pierc- send, [friend. Within these bleak abodes perhaps you'll find [mind? A husband sick in body, worse in Visit the sick, and be the pris'ner's Or sunk in childbed, see his dear- love, [throne, lov'd wife, Lie breathing out the short remains For what you've done to them, is of life; done to me".

The same by Miss Polly Ridler of Hereford, to Dr. Conundrum.

Good Doctor, believe me, you yet may be snug,  
In the arms and affections of charming Miss Lugg.  
Objections are vanish'd, the lady submits :  
If, therefore, you are not enamour'd by fits,  
Interpret her conduct as clearly 'tis meant,  
By silence we modestly give our consent,  
And since of *Diaria*'s daughters you've chosen,  
A nymph, who can warm even blood that is frozen ;  
With diligence hasten, and challenge with spirit,  
The sweetest reward of poetical merit.  
What tho' you can boast nor of butler nor porter,  
Nor promise in vanity's round to support her ;  
You've what are far better to offer instead,  
The riches, at once, of your heart, and your head.  
Who marry for pelf, by the wise 'tis agreed,  
Their happiness venture on nought but a reed. 7, 6, 4  
But founded on love, 'twill be solid, unshaken,  
Adding zest to a meal e'en of eggs and of bacon. 3  
Affection like your's ev'ry comfort must bring,  
Or there's none to be found in the arms of a king.  
If prudence should whisper, that love without wealth,  
Is no more a blessing, than life without health ;  
Reply, that *U* single can suffer no trouble,  
But what most determine when *U* become double.  
Each day shall be happy, bid Peggy remember,  
The longest in June, as the shortest, December.

As I  
Or  
My re  
WI

This done, I'll submit to the death of a martyr,  
If you may not, e'er long, have a sight of her garter.

## Mrs. Lacey's Answer.

How is't, my friend, that you and I  
Have let so many years pass by,  
*The longest and the shortest day,*  
In swift succession pass away,  
And yet of time should make so light,  
As if we could retard its flight.  
*O!* happy they, who in their youth,  
Pursue the road of *beau'ly truth*!  
For age comes on, with hoary hairs,  
And every faculty impairs;  
Our mem'ry fails, our sight grows

Our tongue doth in faint *whispers*  
Nor *egg*; nor *porter* are of use [speak];  
To animate our drooping muse:  
Alas! how then can I declare  
How the keen *reed* divides the air,  
Or by a feeble, faint essay,  
The *arms* of George the 3d display?  
No, 'tis in vain for me to try,  
Farewel, farewell then, *Lady Di*,  
And for your *kindness* to the fair,  
May you their favours ever share.

The same by Dick Shin of Stony-Stratford; to Mall Ormishaw.

Say, Ormishaw, why has the <i>circling sun</i> ,	6
Since thou these pages grac'd, so often run	
His course celestial? Why has he made appear	
<i>The longest day and shortest in the year</i>	8
So oft, whilst thou art silent? Say, does love	
Connubial occupy thy thoughts? — remove	
All other cares? — with sympathetic <i>kiss</i>	2
And fondest <i>whisper</i> fill thy soul with <i>blist</i> ? <span style="float: right;">Pr. 7.</span>	
Has love <i>Diaria</i> banish'd from thy mind?	9
Or for some other cause has thou resign'd	
<i>Thy reed?</i> — Sure the full <i>tankard</i> has no charms	4, 5
For thee. But oh! I fear that in the <i>arms</i>	
Of sickness thou art held. Much I lament	
Those hours in pain and sorrow should be spent,	
Which wit and genius could so well employ	
In classic lore — to raise the heart to joy,	
Or melt to pity — or in sportive strain,	
Under similitudes and tropes, contain	
Much hidden matter, in a thinner shell	
Than does an <i>egg</i> — or darkness to dispell,	3
By which the bard conceals in magic night	
His thoughts, and bring the mystery to <i>light</i> .	10
Oh may those wells that near to Bristol flow,	
With their warm waters wash away thy <i>sore</i> .	2
Then in these pages shall I hope thy pen	
Will teach, <i>in trifles may be taste</i> , again.	
Excuse the muse, thy talents I admire,	
Nor meant it, tho' I once provok'd thine ire.	

## Mr. William Jones thus answers them all.

As I cheerfully traverse the plain,  
Or rest on the banks of the stream;

A nymph of such exquisite charms,

My *reed* breathes a languishing strain;

Ne'er honour'd the village before;

When Phillida graces my theme.

She fills all the swains with alarms;

For all must the fair-one adore.

But how shall I utter my joy,  
 When first she my passion approv'd;  
 How heav'd her soft breast with a sigh,  
 While *whispers* inform'd me, she lov'd.  
 I crop the gay flow'rets of spring,  
 The birds shall their *treasure* resign,  
 To deck the sweet chaplet I'll bring,  
 My Phillida's brows to entwine.  
 Then why will my charmer delay  
 To perfect her Corydon's bliss;  
 To Hymen let's hasten away,  
 And seal his chaste rites with a kiss.

Our flocks then with freedom shall  
 graze,  
 While we sit in the vernal alcove;  
 Thus shall *happiness* crown all our days,  
 And our cot be the mansion of love,  
 Of health and contentment possest,  
 No sighs shall for grandeur arise;  
 No *porter* our friends shall molest,  
 The wretched we'll never despise,  
 When so'l shall to Thetis retire,  
 I'll amuse her with pastoral lays;  
 The nymphs shall my sonnets admire,  
 And *Diaria* resound with her praise.

The same by Mr. Rob. Richardson, of Frosterly.

Soft o'er the bosom of the flow'ry mead,  
 Thro' tender osiers breath'd the vernal gale;  
 When wretched Sylvia tun'd her "lonely *reed*",  
 And lift'ning echo caught the tender tale.  
 " Ye sweet recesses of the vocal grove,  
 Where Philomel attunes her love-lorn lay;  
 Where peace and innocence together rove,  
 And rising pleasures crown each *rising day*;  
 Where oft, beneath yon elm's o'er arching shade,  
 Or where yon woodbines form a fragrant bow'r;  
 At dawn of eve, with Celadon I've stray'd,  
 And bound his crook with many a beauteous flow'r.  
 Where, early as the *herald* of the morn,  
 O'erjoy'd I flew to meet the lovely youth;  
 Where *subisp'*ring breezes kiss yon mantled thorn,  
 To plight my vows of endless faith and truth.  
 Where down yon hill the crystal *brav'rage* flows,  
 Where first we met, — first felt a mutual flame;  
 Sacred to love, the humble cottage rose,  
 And *changing seasons* found us still the same.  
 'Tis done! — 'tis done — the fairy scene is fled,  
 To yonder grove my shepherd's corse they bore; 3d Enig. an egg.  
 With cypress boughs they shade his "clay-cold" bed:— 9th L. Di'ry.  
 'Tis done! — 'tis done! — the joys of life are o'er!"

The same answered by Creep-mouse.

Now at this jovial time o'th' year,  
 Fam'd for long evenings and good cheer,  
 When jocund mortals are most *happy*,  
 And tankards smile with reaming  
*nappy*,  
 When with rude pipe the tuneful poor  
 Chaunt their loud carols at each door,  
 Dear *Lady Dr'ry*, with submission,  
 Again an honest cock's petition  
 Awaits you, and O may his feeling  
 No more experience partial dealing,  
 May gentlemen be not neglected,  
 For country squires, more respected.  
 Now let me *whisper* in your ear,  
 Kissing I'm told goes every where  
 By favour; tho' I'm not offended,  
 Presuming no offence intended,

Yet 'tis a proverb still in season,  
" In roasting eggs there shou'd be  
reason"; Therefore in fine I humbly pray,  
That ev'ry dog may have his day.  
[Granted.]

## The same by Eugenio.

What state is so blest as a sweet single life ?	I
I'm plagu'd with no children, nor vex'd with a wife ;	
I rise when I like, go to bed when I please,	
And spend all my days in a circle of ease. —	8, 6
I've heard of young Cupid, his bow and his darts,	
And that he can wound (when he pleases) our hearts ;	
But laugh at his power, his arrows defy,	4
Still kiss and am free, nor regard him, not I.	2
Let others disconsolate—stray thro' the meads,	
And breathe their soft sighs midst the whispering reeds ;	Pr. 4
If my fair one's unkind, to king's-arms I repair,	11
And drown, in a tankard-of porter, my care. —	5
At eve when bright Phebus his light has withdrawn,	10
And left veil'd in darkness each hill, grove, and lawn,	
The D <sup>r</sup> ry I often peruse with delight,	9
And wish that like Woolston-I verses could write. —	
On an egg oft I sup ; which, on freedom's fair coast,	3
I prefer to rich dainties—where liberty's lost. —	
Thus, free from all sorrow, contented I live,	
Nor grieve for the happiness-Hymen can give.	7

Mr. T. Woolston, in the Character of a Person under Mental Affliction, thus answers the same, in an Ode to Melancholy.

1. What to me are eggs or porter ?  
What to me are blazon'd arms ?  
Or if days be long or shorter ?  
Vain are lov'd Dian's charms.
2. Flown are all those blissful hours  
When the zephyr's whisk'ring gales  
(Sweeping soft the humid flowers  
Down the daisy-painted vales.)
3. Wafted health in balmy kisses—  
Blest delight of vernal youth—  
When I own'd those highest blisses,  
Virtue pure and heav'nly truth.
4. Come then soothing melancholy,  
Mild, majestic, penitive queen,  
Snatch me from those haunts of folly,  
Let me steal thro' life unseen.
5. Where the lofty pines hang bending  
O'er the dark tremendous steep,  
Solitary thoughts befriending,  
Let me there retire to weep.
6. Awful lonesome shades receive me,  
Hide me from the piercing light,  
Let your kind retreats relieve me,  
Till th'arrive of black-brow'd night.
7. Then while shady forms are gliding  
O'er the dreary vaulted tombs,  
Ev'ry worldly thought subsiding,  
Let me hail the pleasing glooms,
8. Then in silent darkness chusing  
Soft beneath its veil to stray,  
On heav'n's blissful glories musing,  
Weeping all my woes away.

## Mr. William Allison's Answer.

T' other night as I alone sat puzzling my brain,  
Endeav'ring th' enigmas aright to explain ;  
Who should enter but Chloe, and jestingly cries,  
" I'll bet you a bottle you don't know the prize".

5

No sooner propos'd than the wager was laid,  
For who could refuse to oblige the dear maid ?  
" What is't then ?" cries Chloe, I answered her straight,  
'Tis neither egg, nor king's arms, cipher, nor light ; 3, 11, 6, 10  
And if Di'ry speaks truth, ma'am, I greatly dispute,  
If summer or winter the theme better suit : " 9  
With the smile of a cherub, " reflect", she reply'd,  
(For the secret no longer the fair-one could hide)  
" Last midsummer's eve, in the jessamine grove,  
When Sylvia set near, how you breath'd forth your love ; " Pr.  
Then pointing the second, cries " pray answer this,"  
*Enraptur'd*, I seal'd her sweet lips with a kiss. 2

The same by Mr. Thomas Eland.

When first in mine ear	<i>L. Diary</i> believe,
The voice of my dear	Thought cannot conceive
Whisper'd softly, "I own I'm in love;	How delightful the minutes did pass;
Transported with bliss,	British porter or ale
An ambrosial kiss	A while may prevail, [last.
I took from the lips of my dove.	But must yield to the charms of my
O, what tender alarms,	When Strephon, she cry'd,
Press'd in each other's arms,	Will you make me a bride,
My breast glow'd with amorous youth;	This fond brooding care to remove ;
All night and all day,	This moment my fair,
Enraptur'd we lay, [truth.	We'll to Hymen repair,
And I long'd for,—but must not tell	And drown Cupid's arrow in love.

The same answered by Kit Went.

The first must be a <i>W</i> ,	With longest and the shortest day
The next a loving kiss ;	Contained in the year.
The third, an egg appears to view,	The ninth, the <i>Ladies' Diary</i> charms,
A reed, the fourth I guess,	The tenth, light signifies ;
Then porter, cipher, bliss, they may	Th' 11th is a coat of arms,
Most properly appear,	A whisper is the prize.

Other ingenious general answers were received from Misses. Ex. Ambrose, J. Bayley, G. Baxter, Miss S. Blackneck, Mrs. E. Bonner, R. Bownas, Miss Di. Browne, Miss E. Cooke, E. D, R. Dowden, Miss M. Empson, G. Fletcher, J. Franks, J. H, R. Hartley, W. Hawkes, J. Jackson, Juvenis. Mrs. B. Lean, Lorenzo, Marcus, J. Marks, S. Oliver, Philo, W. Rebser, W. Richardson, Rufus, Miss B. Smales, F. Smith, R. Willet, P. Williams, and W. Yam.

### ANSWERS TO THE QUERIES, REBUSES, &c.

The REBUSES answered by Mr. R. Richardson, to J. Dixon, Esq; S. Shields, Durham,

To gain a nymph whose angel-form	To Harrowgate—to Guisland too,
Might well the coldest bosom warm,	(Where fortune gave a friend in you)
My youthful steps I fondly bent	The huge Calash, th' umbrella's shade,
To Doncaster—to Newport went;	Explor'd in vain ; the gentle maid

## No. 79. Queries, &amp;c. answered. 23

In scenes like these, ne'er deign'd to dwell ; And clasp'd her to my beating breast.  
 I sought her in the humble cell, Affliction's rod resigns its pow'r ;  
 'Twas here I found the lovely guest, New pleasures crown each rising hour ;  
 Here endless faith and truth profess'd, In peace and joy our days are spent,  
 For, Damon's wedded to content.

The same by Mr. J. Bayley of Middleton, Yorkshire.

*Doncaster, calasb, rod, ten, net, or snare,*  
*Newport, and marry, each rebus declare.*

The same answered by T. B. of Doncaster.

To marry a daughter, to *Newport* I reason'd and argu'd that nine girls went, [content, in *ten*, [pen ; At *Doncaster* leaving my wife, dis- Prefer'd a good husband to *netting* or She scolded and rav'd, and declar'd She look'd in great anger, but an- with a nod, swe'd no more, [door. 'Twere better a girl at 16 had a *rod*. Put on her *calasb*, and walk'd out of

Miss Maria G. thus answers them.

To hide my face or veil my beauty,	To marry I have no intention
No <i>calasb</i> I need to wear ;	'Till a few more funs goes round.
Far remote from crouds I'm seated,	Then perhaps, if honest Damon
Nor at <i>Doncaster</i> appear.	Should from <i>Newport</i> bend his way,
Not a <i>rod</i> within my mansion	I, tho' free, may be entangled
Is there ever to be found ;	In that <i>net</i> that holds the <i>prey</i> .

The same by Miss Betty Smales.

A *calasb* may conceal the fair face of the toast That thinks herself something divine ; No *Newport* nor *Doncaster*'s ladies can boast, Of happiness equal to mine : I'm young and unmarry'd, I'm free from all care ; Twice *ten* years and one I've just seen ; The *rod* of the critic I dreaded last year, But now am content as a queen.

The same by Miss Diana Browne.

*Calasb, Doncaster, rod, and marry,*  
*Newport and ten, cannot miscarry.*

Various other ingenious answers were given by Messrs. W. Allijon, G. Bas-  
 ter, Miss S. Blackneck, Mrs. Eliz. Bonner, R. Bowman, Mr. Brooks, Miss  
 Eliz. Cocke, Miss Hannah Coward, E. D., R. Dees, R. Denning, R. Dowden,  
 T. Eaton, T. Eland, J. Finney, J. Fletcher, G. Fletcher, J. Franks, J. Gruby,  
 J. Hall, R. Harper, R. Hartley, W. Hawkes, J. Jackson, Juvenis, S. Keat,  
 J. Keeling, Mrs. B. Lean, R. M. Marcus, Maria, J. Marks, S. Oliver,  
 Philo, Philomathes, T. Rainbott, W. Rebjur, W. Richardson, A. Rowe, Dick  
 Shin, F. Smith, Mr. Stone, W. Swift, W. Terril, W. Turner, J. W—t,  
 and T. Woolston.

QUERY I. answered by Mr. Mark Elstob, of Shotton.

In my "Trip to Kilkenny" (sold by Goldsmith, Paternoster-Row)  
 p. 17, I have given my opinion on this subject to this effect : The excel-

five cold perceiveable on moors, &c. must be the effect of one or more of the three subsequent causes. 1st, The matter of cold, which adheres to the particles of the air, and is carried about with them, not meeting with any interposition from hedges, is not dashed off, nor diminished. 2d, The matter of cold may be greatly increased by the exhalations from the particular quality of the soil. 3d, The momentum of the air, &c. will be much greater than in enclosures, from its meeting with no obstacle to retard its motion, &c.

Mr. *Samuel Oliver* says, The reason proceeds from the ground being manured and inclosed; the manure affording heat in continual emanations, and the inclosures keeping it confined, as well as preventing the free current of cold air.

Mr. *John Jackson*, besides the above reasons, alledges also the effect of the watery exhalations from waste grounds, and that of their relatively higher situation in the atmosphere.

It was also ingeniously answered by Messrs. *Fletcher, Marcus Rainholt, Richardson, Rowe, Scholasticus, Smith, Swift, Turner, and Miss Eliz. Cooke*.

## II. QUERY answered by Clericus.

The reason of the custom seems to depend on the peculiar satisfaction bodies derive from mutual contact. Attraction is a law that pervades our whole system; and hence all bodies tend to one another; and from their union the animate part of the creation at least finds ineffable pleasure. And the hand being a part well adapted for a conjunction, has enjoyed that privilege, from convenience I suppose. This gentleman then enumerates several passages of both sacred and profane writers, to shew the great antiquity of the custom, which seems to have commenced almost with the creation; and then concludes, it is remarkable that the original expression of a man cleaving to his wife, in Gen. 2 c. 24 v. gives us the idea of parts in contact.

Miss *Eliz. Cooke*, says, The custom of shaking or joining hands, seems to be coeval with mankind; as, in my apprehension, it arises from an impulse of nature, expressive of the great joy at the sudden meeting of a friend in whose company we have great pleasure; which is now extended by custom to a common form of civility.

Nearly in the same manner was the answer given by Messrs. *Fletcher, Jackson, Marcus, Oliver, Richardson, Swift, and Turner*.

## III. QUERY answered by Mr. Geo. Fletcher, of Sheffield.

I am inclined to believe the bird which the Romans called *Cygnus*, to be quite different from our swans, because most ancients agree in its singing, and particularly before death; and Horace mentions it as a musical bird, without the circumstance as a prelude to its non-existence.

Mr. *Jackson* says, As all creatures suffer some pain, and often for a length of time, before their death, which causes them to mourn or complain; so the Swan may have a plaintive piping note to mourn its pain, and which may, by mistake, be deemed a singing, as a prelude to its dissolution.—And Miss *Eliz. Cooke* says the same.—*Marcus* says he has it from unquestionable authority, that the Swan makes a kind of shrieking a little before its death.—And Mr. *Samuel Oliver* says, A gentleman of my acquaintance assures me, that he has heard the wild Swan

king, as by the Query, and that several others have immediately gathered round it, and joined in a kind of elegiac chorus. — Messrs. Richardson, Rowe, Swift, and Turner, are much of the same opinion; and Mr. Francis Smith shews from the anatomy of the heads of birds, that our swans cannot be accounted musical in the sense in which we speak of singing birds.

#### IV. QUERY answered by Mr. J. Jackson, of Northallerton.

“ There is among the ancients a tradition, that the God of Love made a very beautiful rose, the first that had been known, to Harpo-crates the God of Silence, and gave it him to engage him not to discover any of his intrigues to his mother Venus. Hence proceeded a custom to place a rose in the rooms where they met for mirth and diversion, to intimate that under the assurance thereof they might lay aside all constraint and speak what they pleased, and so the rose became a symbol of silence.” — This gave rise to the expression *Under the Rose*, and is also the reason why that flower is dedicated to secrecy in so particular a manner.

Almost exactly in the same manner was it answered by Mr. Fletcher. It was also ingeniously answered by Miss Cooke, and by Messrs. Marcus, Oliver, Richardson, Rowe, and Turner.

#### V. QUERY answered by Mr. John Jackson.

If the bubble of air, together with the component matter within the egg, be broken by brisk shaking, and the egg placed on a flat surface on its greater end, and there held a small space of time by a steady hand; the heaviest parts of the matter in the egg will settle to the bottom, and will keep it in an upright position.

This was also answered by Miss Cooke, and by Messrs. Bayley, Fletcher, Marcus, Oliver, R. Richardson, W. Richardson, Rowe, Smith, and Turner.

### NEW ENIGMAS.

#### I. ENIGMA 625, by T. W.

How, ladies, has it come to pass, That I in enigmatic glafs,	Which they devour without remorse, And empty leave my plunder'd corſe,
Have ne'er been held to public fight, To kill a tedious winter's night?	I oft with heated fury burn, Yet never injure them in turn;
My form, 'tis somewhat strange to tell ye,	Nay e'en before I cool am grown, My service has forgiveness shewn.
Exhibits nought but mouth and A friend to men I've ever been,	To all so needful is my aid, That it with thanks should be re-
From beggar to the king and queen:	paid;
For what my spacious paunch con- tains,	For providence can scarce befriend 'em,
Mankind in life and health sustains.	Unless I my affiance lend 'em.
Themselves to nourish, and their brood,	Ye learned fair discover then,
Men force me to disgorge my food,	Who this warm friend can be to men.

## II. ENIGMA 626, by Mr. John Jackson, of Northallerton.

First know that I in paradise did dwell,  
If even our great Milton truth does tell ;  
And there, as well as here, I do set forth,  
Have always the most busy been on earth ;  
And tho' I choose good grounds for what I do,  
Yet still I sometimes err as well as you.  
I'm oft in burries, tho' I ne'er want time,  
And oft want money, tho' the mint is mine.  
I'm such a raker, that it is no wonder  
I'm often poor, and stand in need of plunder.  
But here you'll think that I'm a spendibrift grown,  
Indeed I painted ladies keep, I own ;  
And rapes on other beds I have committed,  
Ah ! here you'll say, he's for the gallows fitted.  
But stop, dear ladies, — this more strange to tell,  
For all these things my wife does love me well.  
Two other things I have reverse to nature,  
For if I have the gravel, I walk better ;  
And e'en in a consumption thrive the best,  
Tho' I, like you, am easy when at rest.

## III. ENIGMA 627, by Mrs. Blanch Lean.

In many countries I'm produc'd,  
And am to man a blessing :  
But blessings, when they are abus'd,  
A curse prove in possessing.  
There liv'd a race of men on earth  
With nature not contented,  
From them did art derive her birth,  
In various shapes invented ;  
'Mong those, the art to drain my  
Was held in veneration, [blood,  
And deem'd to be extremely good,  
In almost ev'ry nation.

The bucks and rakes, and such like  
And each audacious varlet, [breed,  
When they can get it, they'll exceed  
The Babylonish harlot ;  
Then, ladies, would you know the  
They're capable of doing, [crime  
One letter taken from my name,  
Will shew it to your viewing :  
But justice soon pursues the rakes,  
'Fore whom they stand and tremble,  
Then from my name two letters take,  
You'll see what they resemble.

## IV. ENIGMA 628, by Lorenzo.

Dear ladies, sisters, for to you  
I will reveal what's surely true,  
I cannot tell you what I am,  
For I am never twice the same ;  
I in so many shapes appear,  
That Proteus, if he were but here,  
And thinking on my ways, wou'd own  
That no one is so fickle known.  
You, ladies, very often say,  
You're sure to mention ev'ry day,  
That man's the most inconstant crea-  
ture, [ture ;  
Of all things form'd by art or na-

But I their advocate will be ;  
If ever once you think on me,  
You'll own, with Proteus, you are  
For I can never tarry long. [wrong,  
Go weigh the air and measure wind,  
In chains the angry billows bind ;  
If to such arts you can attain,  
Perhaps a captive I'll remain :  
Nay, tho' I know myself so well,  
My shape I really cannot tell ;  
And 'tis much thought by great and  
small,  
I really have no shape at all.

They who philosophera have read,  
Will find that they have often said,  
That all their labour was in vain,  
Whene'er they try'd me to explain.

Some say I am ; and yet agree,  
I never was, nor e'er can be :  
And then some wiseones loudly bawl,  
I never being had at all.

## V. ENIGMA 629, by Mr. Rob. Richardson, of Frosterly.

Where nature's desert prospects open wide,  
And fleeting snows descend on every side ;  
Where the mute warblers croud the leafleis spray,  
And fury Boreas ushers in the day :  
Hard by yon copse that skirts the trackless mead,  
A stately dome uprears its lofty head :  
With nicest judgment form'd in ev'ry part ;  
The boast of labour, and the pride of art :  
(As erst ambitious Egypt's kings design'd  
To spread their fame, — the wonder of mankind !)  
'Tis here, in happier days beneath the shade,  
A virgin train, in snow-white robes array'd,  
In sportive measures lead the mystic dance ;  
Whilst, crown'd with joy, the laughing hours advance :  
But timely warn'd, they fly the destin'd ground,  
Where desolating horror broods around ! —  
Yet here, tho' thickest glooms obscure the day,  
A sage enchanter bends his devious way ;  
(He by whose magic force Britannia stands  
The dread and wonder of surrounding lands)  
With aspect fierce, the lofty dome ascends,  
Which to his sov'reign pow'r obsequious bends ;  
In vain the architect with nicest art,  
Had rais'd the pile, and fortify'd each part !  
Beneath his stroke its strongest bulwarks fly,  
A prey to Eurus, and a frowning sky !  
Nor rests his rage ; — a train of imps he calls,  
Who, gath'ring round, assail the naked walls ; —  
Yet, whilst it tott'ring stands, ye fair, proclaim  
Its fading glory in the page of fame.

## VI. ENIGMA 630, by Kit Went.

In these corrupt, degen'rate times,  
When men are raised for their crimes,  
Utility I boast ;  
And if my path they will pursue,  
By easy steps I'll lead 'm to  
Possess the highest post.  
There are, who with a good address,  
Purſu'd my steps with eagernes,  
And did their hopes attain ;  
But finding what a pond'rous weight  
They had to bear, resigned strait,  
And soon retir'd again.

Indeed I am so much in vogue,  
That manyan honest man, and rogue,  
Have raised been by me ;  
Yet there are none who can ascribe,  
To me receiving any bribe,  
Or e'en a paltry fee. [gag'd,  
When Britain's sons have been en-  
Where war and dreadful slaughter  
I have assistance given ; [rag'd,  
Likewise where fancy's airy scene,  
Or where strange thoughts oft inter-  
I've shewn the way to heaven. [vene,

## VII. ENIGMA 631, by S. L. J.

An emblem both of grief and joy  
Would fair Diarian's tho'ts employ,  
And hope 'twill not be deemed rude,  
Since as no stranger I intrude.—  
Both sexes my acquaintance share,  
Tho' most I'm frequent with the fair,  
And act that truly worthy part,  
To speak the feelings of the heart.—  
When gloomy sorrows fill the breast,  
By me those sorrows are exprest :  
When social mirth and joys abound,  
And peals of laughter burst around,  
I'm oft attendant on that mirth,  
Those peals of laughter give me birth  
When friendless orphans make their  
pray'r,  
By me they witness their despair ;  
And widows too by me would move

Mankind to pity and to love.  
I'm pity's child, no gen'rous breast  
Of me was ever dispossess'd.  
Love prompts me sometimes to attend  
The fun'ral service of a friend.  
At Hymen's altar too I've been ;  
Oft with the happy fair-one seen ;  
And oft have giv'n the lover aid,  
To win attention from his maid,  
On crowned heads I sometimes wait ;  
On men of ev'ry rank and state ;  
Have rested on the regal bed,  
And on the cheek of beauty fed :  
I've too—but hush ! too far I've gone,  
Then one hint more and I'll have done,  
From dreams I've sprung while man  
has slept, [wept].  
And shone most bright when "Jesu

## VIII. ENIGMA 632, by Daphne.

Ladies permit a mask to greet ye,  
Nor hurry by me when you meet me ;  
For little as you find my stature,  
Of great importance is my nature ;  
The king himself great def'rence  
pays me,  
And ever when we meet obeys me ;  
Nay this a truth beyond dispute is,  
He in my prefencg always mute is.  
I generally appear in sable,  
But if I will in gold I'm able.  
You find me oft near woodbinebow'rs,  
Or purling rills, and banks of flow'rs ;  
And often too near purling fountains,  
Or at the feet of lofty mountains.  
Yet hostile scenes alike delight me,  
Nor can the murd'rous engine fright  
me.

"Tis true I do myself from fear guard,

By keeping always in the rear-guard,  
My brethren's posts may bolder shew  
them, [them] :  
For nearer much the van you view  
They're 3 in number, and their sta-  
tion's,  
Like mine, useful to most nations ;  
Nay think not this is a delusion,  
For without us all is confusion ;  
When num'rous bands, the plain  
o'respreading, [ing],  
Would on each others heels be tread—  
My brethren lend me their assistance,  
To keep 'twixt each a proper distance;  
But yet their worth's of less dimension  
Than that to which I have pretension ;  
They, mixing in disputes, befriend  
'em,  
Whilst I alone am sure to end 'em,

## IX. ENIGMA 633, by Eugenio.

Deep in a cavern hid from mortal sight  
I live, debarr'd of ev'ry ray of light.  
From thence I never yet was known to rove,  
Yet all will own I do not cease to move.  
Tho' thus confin'd within my cell I keep,  
I oft have wander'd o'er the foaming deep,  
Have brav'd the heat beneath the torrid zone,  
And been in lands to Britons yet unknown.

Tho' sometimes of the smallest force afraid,  
I've been in hottest battles undismay'd ;  
Have fac'd the cannon, and the shining lance,  
When pointed by the bravest sons of France ;  
Undant'd oft have plung'd amid the main,  
Soar'd high in air, or skim'd the flow'ry plain.  
Bereft of me the gen'ral could not fight,  
The lawyer argue, nor the poet write ;  
The lover could not tell, without my aid,  
His tender passion to the blushing maid. —  
Strange inconsistencies in me appear,  
I'm bold and fearful, tender and severe,  
Chearful and melancholy, false and true,  
Deceitful, honest, kind and cruel too ;  
I'm hard and soft, good, bad, and old and young,  
Animate, inanimate, weak and strong. —  
Take one hint more, and then my name I crave,  
Ladies, I'm what you have — or ought to have.

#### X. ENIGMA 634, by Miss Polly Ridler, of Hereford.

I am a composition odd,  
Was ne'er design'd perhaps by God.  
What is my form you'll hardly guesse,  
For I nor head nor hands posesse :  
Yet feet I have, tho' never walk ;  
Use many words, yet never talk.  
Both pain and pleasure I can give,  
And longer than my maker live.  
Perhaps my sex I should reveal ;  
I'm neither female then nor male.

'Tis strange you'll say, but still 'tis  
true,  
I'm born of man and woman too.  
And tho' to none I ever speak,  
Both sexes my acquaintance seek.  
My parts must be minutely ken'd,  
Before I'm known to dearest friend ;  
For oft my feature-lines in vain,  
Are studied o'er and o'er again:  
And even tho' before your eye,  
You sometimes cannot me descry.

#### XI. ENIGMA 635, by Mr. William Jones, of Hayford.

Lift, ye fair, and I'll discover  
What perhaps will make you  
smile  
In the absence of your lover,  
And a pensive hour beguile,  
Argus, fam'd in ancient story,  
Can't for eyes with me compare ;  
Can't of greater actions glory,  
In the service of the fair.  
Should a polish'd gay intruder  
On your spotless garments seize,  
I push off the fly deluder ; —  
All my pride's to give you ease.

I from danger oft defend you,  
When you're sporting o'er the  
lawn ;  
Tho' a pigmy I befriend you,  
Help you pierce the wanton fawn.  
I assist to stop the rover,  
Whether Irish, Scotch, or Dutch,  
Fix their borders, bind them over,  
Lest they should infringe too much.  
More I could, but dare not tell you,  
Left I should appear too vain :  
From what's said, the beau, and  
belle too,  
Will with ease my name explain.

XII. (PRIZE) ENIGMA 636, by Mr. T. Woolston,  
of Adderbury, Oxon.

My youthful days are spent among the swains,  
Where peace and freedom bless the flow'ry plains ;  
Or on the silver streams in verdant meads,  
Where zephyrs softly whisper thro' the reeds.  
Protected by my parent there I rove,  
In those gay scenes of innocence and love.  
But ah ! what ills await the fatal day,  
When from those scenes my parent's forc'd away :  
In vain I lend my aid, she falls forlorn,  
And from her fast'ring side by force I'm torn ;  
Helpless, in vain she must my loss deplore,  
For I alas ! must see her face no more.

In size I'm found a little dapper spright :  
(My colour various ; oft of purest white ;)  
Yet tho' so small, the wonders I have wrought,  
Almost surpass the bounds of human thought ;  
My legal offspring mighty kingdoms sway,  
And potentates themselves must these obey.  
When nature's laws the god-like Newton scan'd,  
And science rose beneath his plastic hand.  
He flew to me each motion to explain,  
Or still mankind had fought the cause in vain.  
Such my extensive pow'r, it may be said,  
That laws and arts subsist but by my aid.

On yonder sloping plain a cavern lies,  
Whose depth profound my needful want supplies ;  
A dismal place, no cheerful glimpse of light,  
But gloomy darkness black as tenfold night,  
And awful silence, reign — there far from day,  
Where mortal yet was never known to stray,  
In those drear regions undismay'd I stand,  
And, monarch-like, maintain the sole command.

By thirst of gold, or curled lust of power  
Impel'd, I move in some ill-fated hour ;  
Collecting all my force, I issue forth,  
Black as the tempest rising from the north,  
In columns leading on a mighty train,  
And scatter thousands o'er the listed plain.

Another hint to clear the mind from doubt,  
I may assist perhaps to find me out.

NEW REBUSES and QUERIES.

I. REBUS, by Orestes, of Penryn.

The instrument that lovers use,  
Their am'rous passion to disclose,

| When join'd to what I've often said  
| Her cheeks were like, being lovelier'd,

N<sup>o</sup> 79. New Queries and Rebusess.

With ease a nymph will bring to view,  
Who's kind, sincere, and virtuous too.  
But tho' her name you now express,  
For two to one you are to gueis.\*

\*Being on the eve of matrimony.

## II. REBUS, by Mr. John Stafford, of Bingham.

A measure ye fair that in scripture is nam'd,  
The letters therein if they're properly fram'd,  
Disclose a large city in days of yore fam'd.

## III. REBUS, by R. M.

The bold commander, who from Greece Did fail to fetch the golden fleece ;	A name that rules the British land : And what becomes a soldier's hand ;
The British prince who did prevent The Danish Hubba's proud intent.	The drowsy bird that rules the night ; The ruler of the ocean bright :
The noble herald of the morn, Who acquaints you, day is born ;	Th' initials join'd, the name will shew Of one whose learned, kind, and true,

IV. REBUS, by Mr. John Bayley, of Middleton,  
Yorkshire.

A fragrant flower by ladies much ador'd,  
A grain Great Britain doth in store afford,  
A charm in maids that first attracts the sight,  
A father's joy and most supreme delight,  
A fruit in form like the terrestrial ball,  
A bird whose notes admired are by all.  
If these initials you are pleas'd to join,  
They'll name a fair in whom all virtues shine.

## V. REBUS, by Daphne.

Let us, ye fair, five hundred gain, And near it place a trusty guard,	We then shall see, for all our pain, If prudence guides, a sweet reward.
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## VI. REBUS, by Mr. R. Richardson, of Frosterly.

She who in vain foretold the fall of Troy ;  
And she, belov'd by Priam's am'rous boy ;  
Cynara's son, by Venus mourn'd in vain,  
When the fierce boar her lovely hope had slain ;  
The king whose son by lawless conquest hurl'd  
Death and destruction o'er a bleeding world ;  
The faithful guardian of Ulysses' son,  
Who taught him, vice in all its shapes, to shun ;  
The Grecian chief who for a girl did weep ;  
And he whose trident rules the roaring deep.

Th' initials join'd, you thence may quickly trace  
 "A maid unmatch'd in manners as in face;  
 Skill'd in each art, and crown'd with ev'ry grace."  
 Where Wear's fair stream its parent ocean joins,  
 The pride, the envy of her sex she shines.

### I. QUERY, by Mr. Robert Richardson.

Whence arose the interjection *Bo!* or *Bob!* — a word of terror, used by nurses to frighten children?

### II. QUERY, by Mr. Samuel Oliver, of Mansfield.

Whether is much scientific learning, a little, or none at all, most conducive to human happiness?

### III. QUERY, by Philarithmus.

There is a latin saying, *Butyrum mane est aurum, meridie argentum, vesperi plumbeum*; that is, Butter is gold in the morning, silver at noon, lead at night: can any physical reason be assigned for this operative quality of butter on the animal economy?

### IV. QUERY, by J. H. Junior.

Set a tankard full of ale with the ear opposite the fire; the ale will heat, and the ear will not be hot. Required the reason.

### V. QUERY, by Mr. J. Jackson, of Northallerton.

What is the true reason why men drinking freely of wine, should be intoxicated; when eating ever so freely of the fruit or grapes, never has that effect.

\* \* \* The number of prizes are eight, to be determined by lot, viz. one of 10 and one of 8 diaries for the solutions of the prize-enigma; two of 10 diaries each for the general solutions of the enigmas; two of 8 diaries each for the solutions of the queries and rebuses; also one of 12 and one of 8 diaries for the solution of the prize-question. The competitors for the prizes given for the solutions of the prize enigma and prize question, must send their letters, containing those solutions, before Candlemas day; and all other letters for the use of the Diary, must be sent before the 1st of May. — Our correspondents are requested to make their compositions as short as possible with propriety; as many are unavoidably omitted from their too great length. They are not however always to conclude that their pieces are rejected when they do not see them inserted the 1<sup>st</sup> or 2<sup>d</sup> year after they are sent; because they are often kept back for several years, thro' the great number that come to hand, that we may give every one his turn. — Solutions to be sent with all new propositions. — The letters of Mr. Tho. Barker, Mr. J. Roose, and Mr. J. Young, came too late to hand last year to be acknowledged.

## ANSWERS to the MATHEMATICAL QUESTIONS.

## I. Question 772 answered by Mr. Thomas Serjeant\*.

SINCE each equation contains the square of a letter together with the product of that letter by the sum of all the other letters, it is evident that the sum of all the equations will be the square of the sum of all the letters, and therefore the square root of the sum of the equations is  $v + x + y + z = \sqrt{1296} = 36$ ; by which dividing each of the equations, we have  $v = 252 \div 36 = 7$ ,  $x = 504 \div 36 = 14$ ,  $y = 396 \div 36 = 11$ , and  $z = 144 \div 36 = 4$ . Hence

Gold is what the nymph requires;

Grant her that, she'll quench your fires.

And thus was the solution given by Messrs. Ro. Bownas, Ra. Dens, J. Fletcher, Horticultura, J. Lean, W. Paull, W. Penn, W. Reynolds, W. Richardson, Jo. Saul, and Ja. Williams.—But the proposer, Mr. J. Penberthy, as also Messrs. J. Branfby, J. Brinkley, B. R. Fox, R. Hartley, J. Keeling, Edw. Littlewood, S. Oliver, B. Patterson, Pilander, J. Phillips, T. Rainshott, W. Rebjur, T. Robinson, T. Sealing, Paul Sharp, W. Terril, Jo. Watson, and J. Whitton, dividing each equation respectively by  $v$ ,  $x$ ,  $y$ ,  $z$ , the four quotients give each an expression for  $v + x + y + z$ ; which therefore being equated to each other, the values of three of the letters are obtained in terms of the fourth, and which being substituted in one of the original equations, the whole becomes known.—And Mr. Richard Dening and Mr. John Mole solve it thus: Since in the four equations, each letter is multiplied by the same quantity ( $v + x + y + z$ ), these letters are respectively proportional to the given numbers; and as these are to be whole numbers, the given numbers divided by 36 their common measure give the same values as before. Other solutions were given by Messrs. J. Adburner, J. Bartlett, R. Dowden, H. Furness, J. Gruhy, W. Hawkes, W. Marwood, Jo. Peet, A. Rowe, H. Weetman, T. Wilkin, and Geo. Wood.

## II. Question 773 answered by the Rev. Mr. Hellins.

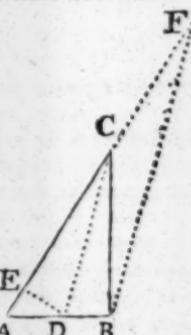
If the  $\triangle ABC$  represent the garden, and D the place of the tree; and if C, D be joined, and there be drawn DE  $\perp$  AC; it is evident from the principles of optics and geometry, that  $\angle ACD = \angle DCB$ , and  $DE = DB$ . Now as  $\frac{1}{2} AC \times DE + \frac{1}{2} BC \times DB = \text{area of } \triangle ABC$ , and AC and DE ( $= DB$ ) are given, we have only to find BC, and the area will be known.

Put  $AC = 100 = a$ ,  $BD = 20 = b$ , and  $BC = x$ : then  $AB = \sqrt{aa - xx}$ , and the area =

$x\sqrt{aa - xx} = \frac{1}{2}b \times a + x$  (by what hath been premised). This equation being cleared of the surd A

and divided by  $a + x$ , we get  $xx \times a - x = bb \times a + x$ , or  $x^3 - x^2 + bbx + abb = 0$ , or in numbers  $x^3 - 100x^2 + 400x + 4000 = 0$ , where the two positive values of  $x$  are 90.7326 and 26.1355; and the corresponding areas 1907.326 and 1261.355 square yards, either of which answers the question.—The third root is — 16.8681.

\*Who has lately published A Synopsis of Logarithmical Arith. Price 2s.



SCHOL. It is evident from what is done above, that, if there be drawn  $BF \parallel DC$ , meeting  $AC$  produced in  $F$ , it will be  $AF : AE :: BC^2 : BD^2$ .

NOTE. This question was inserted by particular desire, on account of a dispute which it occasioned.

Ingenious answers were also given by Messrs. Bartlett, Bownas, Brinkley, Dalton, Dees, Dowden, Fletcher, Furness, Hartley, Hawkes, Horticultura, Lean, Mole, Oliver, Patterson, Peet, Penn, Phillips, Reynolds, Richardson, Robinson, Rowe, Saul, Scaling, Terril, Watson, Weetman, Wilkin, Whitton, Williams, and Wood.

### III. Question 774 answered by Mr. Wm. Richardson, of Backworth.

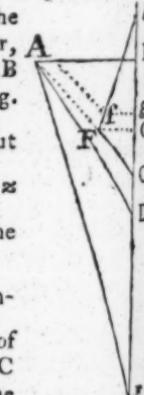
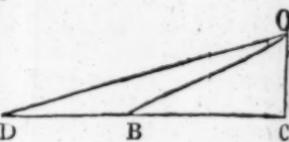
LET  $BCO$  be a vertical section of half the hill,  $O$  the vertex,  $D$  the object, and  $C$  the center of the circular base. Then  $360 : 342$  or  $20 : 19 :: BO : BC :: 1 : .95$ , the sine of  $\angle BOC$ , which  $D$  therefore is  $= 71^\circ 48' 18''$ , and its comp. or  $\angle OBC = 180^\circ 11' 42''$ ; hence  $\angle B - \angle D = \angle BOD = 5^\circ 10' 42''$ ; then s.  $\angle O : s. \angle D : : BD = 6 : BO = 14.97305$ ; lastly, by Rule 2, pa. 98, of Hutton's Mensuration, the area of the field is  $BO^2 \times 3.14159 \text{ &c.} \times 19 \div 20 = 669.1045 \text{ sq. chains} = 66 \text{ ac. } 3 r 25.672 \text{ p.}$

It was also ingeniously answered by Messrs. Bartlett, Bownas, Brinkley, Dees, Dowden, Elftob, Fletcher, Hartley, Horticultura, Lean, Mole, J. Phillips, Reynolds, Rowe, Saul, Scaling, Terril, Watson, Weetman, Wilkin, Whitton, and Williams.

### IV. Question 775 answered by the Proposer, Mr. Joel Lean.

LET  $E, D, C$  be the three stations,  $AF$  one side of the outer octagon, and  $FG \perp BGCE$ , half of another,  $A$   $AB \perp BE$ . Put  $CE = 120 = a$ ,  $CD = 20 = b$ ,  $AB = BC = z$ , and  $x = \tan. \angle E$ : then (by Emer. Trig. b. i, prop. 33, cor. i.)  $\frac{3x - x^3}{1 - 3x^2} = \tan. \angle D$ . But by trigon.  $i : x :: a + z : z$ , and  $i : \tan. \angle D :: b + z : z$ ; from the first equation  $z = \frac{ax}{1 - x} =$  (from the 2nd)  $\frac{3bx - bx^3}{1 - 3x - 3x^2 + x^3}$ , which equation in numbers gives  $x^3 - 3.4x^2 - 3x + .6 = 0$ , the root of which is  $x = .16917$ ; and hence  $z = 24.4339 = BC = Gh$ , if  $b$  is the center of the octagon.—Then, in the  $\triangle bfg$  are given  $bg = 22.4339$ , and all the angles, viz.  $\angle f = 45^\circ$ , and  $\angle b = 22^\circ 30'$ ; hence  $16 \times \triangle bfg = 8 \times bg^2 \times \sqrt{2 + 1} \times \sqrt{2 - 1} = 8 \times bg^2 \times \sqrt{2 - 1} = 3.3137085 bg^2 = 1667.724$ , the area of the floor within the walls.

It was also answered by Messrs. Bartlett, Brinkley, Dees, Dowden, Fletcher, Horticultura, Mole, J. Phillips, Reynolds, Richardson, Robinson,



SUPP  
DP  
the figure  
MacLaurin  
proves  
species;  
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## No. 79. Questions answered.

35

*Rowe, Saul, Scaling, Sharp, Terril, Watson, Weetman, Whittom, Wil-  
liams, and Wood.*

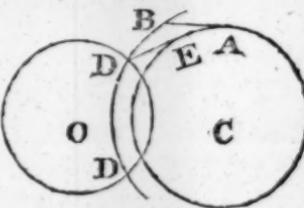
## V. Question 776 answered by Horticultura.

IT is demonstrated, (Simson's Conics, cor. to pr. 29. lib. v. or Emerson's Conics, cor. 3. to prop. 65.) that the rectangle under the segments of the line drawn through, and made at the focus of an (ellipsis or) hyperbola, is equal to the rectangle under the whole line and  $\frac{1}{4}$  the latus-rectum of the axis. Consequently the constant quantity in question is =  $\frac{1}{2}$  the said latus-rectum.

In this manner it was also answered by *Amicus*. And other demonstrations were given by Messrs. Fletcher, Hartley, Rowe, White, and the proposer, Mr. Turner.

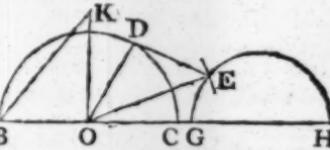
## VI. Question 777 answered by Amicus.

To any point A of the circle, let a tangent AB of the given length be drawn, and with CB radius describe a circle cutting the other given one in D, then drawing the tangent DE to the former given one, E will be the point required. For DE is evidently equal BA; and when the circle BD neither cuts nor touches DD, it is manifest that the problem is impossible.



The same by Mr. John Fletcher, of Chester.

BH being the line passing through the centers of the two given circles, on O the center of one of them erect OK  $\perp$  BH and = the given tangent; and with the center O and radius BK cut the other circle in E, the point required. For, drawing the tangent ED, and OD, then BO = OD, BK = OE, and  $\angle O = \angle D$ , a right angle,  $\therefore DE = OK$ , the given line.

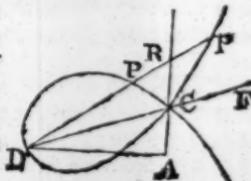


LIMIT. It is evident, that the given line cannot be greater than the tangent drawn from H, nor less than the tangent from G, which are the greatest and least tangents; that is, it must not be greater than a mean proportional between HC and HB, nor less than a mean proportional between GC and GB.

This question was also constructed by Messrs. Brownas, Brinkley, Clarke, Hartley, Horticultura, Latbam, Lean, Littlewood, Parnel, Reynolds, Saul, Watson, and White. And algebraically answered by Messrs. Dees, Richardson, Rowe, and Terril.

## VII. Question 778 answered by Amicus.

SUPPOSE DAC to be the given triangle, and DP a position of the revolving line; then the figure corresponds with fig. 38, tab. V. of MacLaurin's Geomet. Organica, where the curve proved at pa. 36 to be Sir Isaac Newton's 34th species; and when CF is taken = CD, its asymptote passes through F and  $\parallel$  AC.



The same by Mr. Nathan Parnel.

LET ABC be the triangle, AD the revolving line, and P the point. Then put  $a = AB$ ,  $b = BC$ ,  $x = PE$ , and  $y = CE$ ; and we shall have  $a - x = AF$ ,  $b + y = FP = BE$ ; also by sim.  $\Delta s$ ,  $a - x : b + y :: x : b + y \times x \div a - x = DE$ ; and, by 47 Eucl. I.  $x^2 + b + y^2$   
 $x^2 \div a - x^2 = PD^2 = DC^2 =$

$y + b + y \times x \div a - x$  by the question; this equation, reduced, becomes  $ax^2 - x^3 = ay^2 + xy^2 + xbxy$ , the equation expressing the nature of the curve.—When  $y = 0$ ,  $x$  is  $= 0$  or  $= a$ ; which shew that the curve passes through the angular point G of the □ AGCB. And when  $y = -b$ ,  $x$  is  $= a$  or  $= b$ ; which also shews the curve passe through the angular point A, and likewise decussates the base AB at the distance of BC from the right angle.

Other ingenious solutions were given by Messrs. Bowmnas, Cole, Den Dowden, Fletcher, Hartley, Horticultura, Richardson, Saul, Terril, Watson, and Whise.

### VIII. Quest. 779 answered by the Proposer, Mr. N. Parnel.

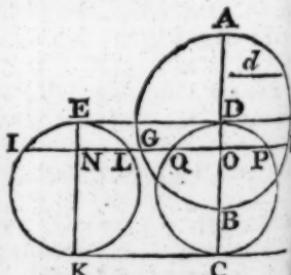
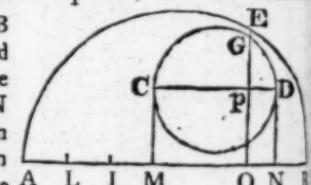
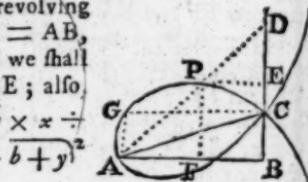
**CONSTRUC.** Draw the diameters AB and CD, of the given circles AEB and CGD, in a direction perpendicular to the line given in position, also CM and DN parallel to the same line or  $\perp$  AB, and in AB take AI : IB :: R : S in the given ratio, also take AL : AI :: AI : IB the same ratio, or  $AL \times IB = AI^2$ ; lastly,  $\perp$  to AB draw EGPO (prob. 7, book 2, Wales's Determ. Sect.) cutting AB in O, so that  $AO \times OB : MO \times ON :: IB : AL$ ; so shall EO : GP :: S : R, as required.

**DEMON.** By constr.  $MO = CP$ , and  $ON = PD$ ,  $\therefore$  by prop. 6 circle  $AO \times OB = EO^2$ , and  $MO \times ON = PG^2$ ; whence by const.  $EO^2 : GP^2 :: IB : AL :: IB^2 : AL \times IB = AI^2$ , or  $EO : GP :: IB : AL :: S : R$ .

**NOTE.** The construction would be performed nearly in the same manner, let the positions of the circles be what they may.

The same by Mr. John Hampshire.

**CONSTRUC.** Let  $d$  be the line given by position,  $R$  to  $S$  the given ratio, and  $AGBH$ ,  $EIKL$  the two given circles; to the lesser of which parallel to  $d$  draw the indefinite tangents EF and KC, and  $\perp$  to EF or KC the diameters ADB and ENK, to cut the tangents in D, C and E, K. Then (by prob. 4 of Lawson's, or prob. 7 of Wales's Determ. Sec.) cut AB (produced if necessary) in O, so that  $OA \times OB : OC \times OD :: R^2 : S^2$ ; through O and  $\parallel$  to  $d$  draw ILCOH, the line required.

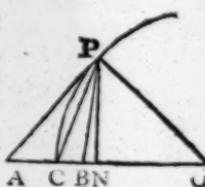


**DEMONS.** On the diameter DC describe the circle DPCQ to touch the tangents EF and KC in D and C. Then, by parallel lines,  $CD = KE$ ,  $CO = KN$ , and  $DO = EN$ , conseq.  $PQ = IL$ . But, by construc. and the property of the circle,  $OA \times OB = OH^2 : OC \times OD = OP^2 = IN^2 :: R^2 : S^2$ , or  $GH : IL :: R : S$ .

Geometrical solutions from first principles were given by *Amicus*, Mr. H. Clarke, and Mr. G. Sanderson; also other constructions by Mr. John Fletcher, and Mr. Edm. Littlewood. And algebraical solutions by Messrs. Bownas, Brinkley, Dees, Horticultura, Lean, Ja. Philips, Reynolds, Richardson, Robinson, Rowe, Saul, Terril, Watson, White, and Williams.

### IX. Question 780 answered by Amicus.

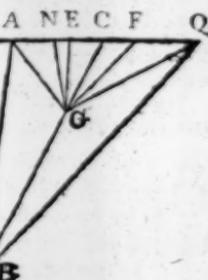
Let P be the port sailed from, PN its meridian, PC a small part of the N. N. E. rhumb,  $NO \perp PN$ , O the center of a circle passing through P and C, and  $PN = \text{unity}$ ; then  $PO = CO = \sqrt{2}$ , and  $CN = \sqrt{2} - 1$ ; and, by the lemma at pa. 336 Simpson's Algebra, if there be taken  $AC : CO :: AC - BC : BC :: AP - PB : PB :: (\text{by the question}) 2 : 7$ , then PA and PB will be the courses of the ships,  $AC = \frac{2}{7}\sqrt{2} = .4040610$ ,  $CB = \frac{2}{7}\sqrt{2} = .3142697$ ,  $AB = .7183307$ ,  $AN = .8182746$  = tangent of  $39^\circ 17'$  one course,  $AP = 1.292118$ ,  $BN = .0999439$  = tangent of  $5^\circ 42'$  the other course,  $PB = \frac{7}{9}AP = 1.0049806$ . And since the whole rhumbs are proportional to their parts PA, PB, and the distance of the ports may without sensible error be taken along the parallel of latitude that passes through them, we have  $3.0154293 = AP + BP + AB : 656$  (per quest.) ::  $AP : 281.0977 =$  the dist. run on the course PA ::  $BP : 218.63 =$  its dist. run ::  $AB : 156.2708 =$  the dist. of the ports arrived at ::  $PN : \text{the diff. of lat.} = 217.5478$  miles. Nearly in the same manner is the constr. by Mess. Dees and Richardson.



The same by Mr. John Brinkley, of Harleston.

UPON an east-and-west line R take AQ = 656, the sum of the three sides of the triangle formed by the three ports, which divide in C in the given ratio, namely  $7 : 9 :: AC : CQ$ . Draw CB the N. N. E. rhumb; so take CR : CQ :: CA : CQ - CA, and with center R and rad. RC cut CB; draw GQ to meet the  $\angle Q$ ; then draw GF to BQ, and GE  $\parallel BA$ ; so shall G, E, F be the three ports.

For since  $AB : BQ :: AC : CQ :: 7 : 9$ , by lem. p. 336 Simp. Alg.  $\angle B$  is bisected by BC, and  $ABQ$  is similar to the triangle formed by the three ports. Because  $GF \parallel BQ$ ,  $\therefore \angle FGQ = \angle GQB = \angle FQG$ ,  $FG = FQ$ . And because  $QG$  bisects  $\angle Q$ ,  $\therefore BG : GC :: BQ : CQ :: (\text{by constr.}) BA : AC$ ,  $\therefore AG$  bisects the  $\angle A$ ; and for the like



reason that  $FG = FQ$ , is  $EA = EG$ . Consequently  $EG + EF + GF = AQ$  the given sum, and  $EGF$  is sim. to  $ABQ$ .

**CALCUL.** In the  $\triangle BQR$  are known RB, RQ, and the  $\angle R$  ( $= 2$  compl.  $\angle C$ ), whence is found  $\angle Q = 50^\circ 42'$ , and from thence the  $\angle QAB = 95^\circ 42'$ , and  $QBA = 33^\circ 36'$ . Also in the  $\triangle CQB$  are known CQ and the angles, hence CG will become known, and from thence FG = 281.068, EG = 218.608, and EF = 156.324; also the dif. of lat. GN = 217.502 miles; therefore the lat. sailed to was  $51^\circ 53' N.$  and the course of both ships was from the N. towards the E. that of the one  $5^\circ 42'$ , and the other  $39^\circ 18'$ .

Geometrical solutions were also given by Messrs. Clarke, Fletcher, Horticultura, and Sanderson, and algebraical solutions by Messrs. Borrow, Hartley, Lean, Mole, Ja. Phillips, Robinson, Rowe, Saul, Sayer, Terril, Watson, White, and Williams.

X. Question 781 answered by Amicus.

**P**RODUCE the given diameter BD to N till  $DN : DO$  in the given ratio, and from the given point A take  $AM : AO :: ON : OD$ , then by Simpson's Geom. V. 18, take  $OE : OD :: ON : ME$ , and E is the point required.



For since  $OE : OD :: ON : ME ::$  (by sim.  $\Delta$ s)  $OF = OD : OG$   
therefore  $ON : OD :: ME = AE - AM : OG = AG - AO$ ;  
by constr.  $AM : AO :: ON : OD$ , consequently  $ON : OD :: AE : AG$   
or by division  $DN : DO :: GE : GA$ .

Mr. Na. Parnell and Mr. Geo. Sanderson also both construct this problem by the same 18. V. of Simpson's Geometry.

The same by Mr. Thomas White, of Alnwick.

C being the center, and  $m : n$  the given ratio, bisect AC in H, and take  $HI : HC :: m : m + n$  and  $:: CK^2 : CD^2$ , erecting  $CK \perp CD$ ; make  $IG = IK$ , erect the  $\perp GF$ , and draw the tang. FE meeting BD in E, the point required.



DEMONS. For  $m+n:m::CD^2:CK^2$  by constr. But  $CD^2 = CF^2 = CG \times CE$  (Eucl. VI. 8), and  $CK^2 = IK^2 - IC^2$  (I. 47).  $IK^2 - IC^2$  (constr.)  $= CG^2 + CG \times 2CI$  (II. 4). Therefore  $m:n:: (CG \times CE : CG^2 + CG \times 2CI ::) CE : CG + 2CI$  (VI. 1).

Again, by confir.  $m + n : m :: \text{HC} : \text{HI} :: (\text{2 HC or}) \text{ AC} : \text{2 HI}$  (V. 15).

Therefore  $(V. 12) m+n:m:: (CE + CA \text{ or } AE : (CG +$   
 $+_2 HI = CG +_2 CH = CG + CA =) AG$ , and  $n:m:: GA$  (V. 17).

SCHOL. Hence the least triangle and cone may be geometrically inscribed about a circle and a sphere, or any segment of them; A being center of the base of the segment, F the point of contact, and E the vertex of the triangle or cone; also in the triangle and circle  $AG = GE$ , but in the cone and sphere  $AG = \frac{1}{2}GE$ . See the Scholia, pa. 201, 202 Simpson's Geom.

Other constructions were given by Mr. Clarke, Mr. Fletcher and Mr.

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Hartley. And algebraical solutions by Messrs. *Bownas, Brinkley, Dees, Doveden, Horticultura, Lean, Ja. Phillips, Reynolds, Richardson, Robinson, Rowe, Saul, Sharp, Terril, Watson, Whittom*, and *Williams*.

XI. Quest. 782 answ. by Mr. Rob. Hartley, of Daresbury.

It is evident that  $\frac{3}{4} \text{ fl. } \sqrt{1-x}^{-\frac{1}{2}} \dot{x} + \sqrt{1-x}^{-\frac{1}{2}} x \dot{x} - \dot{x}$  is  $= \frac{3}{4} \text{ fl. } \frac{\dot{x}}{\sqrt{1-x}^{\frac{3}{2}}} - \dot{x}$  (See pa. 116 of Clarke's Inf. Series)  $= \frac{3}{4} x$

$\sqrt{\frac{2}{1-x}} - x - z$ ; therefore the whole given expression becomes

$\frac{1}{2x^2\sqrt{x}} \text{ fl. } \dot{x} \times \text{ fl. } \frac{x^{-\frac{1}{2}}\dot{x}}{\sqrt{1-x}} - \frac{1}{2}x^{\frac{1}{2}}\dot{x} - x^{-\frac{1}{2}}\dot{x} = (\text{by pa. 16 of}$

the same book)  $\frac{1}{2}x^{-\frac{3}{2}} \text{ fl. } \frac{x^{-\frac{1}{2}}\dot{x}}{\sqrt{1-x}} - \frac{1}{2}x^{\frac{1}{2}}\dot{x} - x^{-\frac{1}{2}}\dot{x} - \frac{1}{2}x^{-\frac{5}{2}}$

$\text{fl. } \frac{x^{\frac{1}{2}}\dot{x}}{\sqrt{1-x}} - \frac{1}{2}x^{\frac{3}{2}}\dot{x} - x^{\frac{1}{2}}\dot{x} = ax^{-\frac{3}{2}} - \frac{1}{6} - x^{-1} - \frac{1}{2}ax^{-\frac{5}{2}}$

$+ \frac{1}{2}x^{-2}\sqrt{1-x} + \frac{1}{10} + \frac{1}{3}x^{-1} = \frac{2x - 1}{2x^2\sqrt{x}} a + \frac{\sqrt{1-x}}{2x^2} - \frac{2}{3x}$

$- \frac{1}{5}$ , where  $a$  is the circ. arc, rad. 1, fine  $\sqrt{x}$ . And when  $x = \frac{1}{2}$ , the first term is  $= 0$ , and the others become  $\sqrt{2} - \frac{7}{5}$ , the quantity sought.

The same by Amicus.

THE last correct fluent of the given expression, as above, is  $=$

$\frac{3}{4}x : \frac{z}{\sqrt{1-x}} - x - z$ , hence that of  $\frac{3}{2} \cdot \frac{\dot{x}}{\sqrt{x}} \times \frac{3}{4}x : \frac{z^2}{\sqrt{1-x}}$

$- x - z$ , or of  $\frac{\dot{x}}{\sqrt{x-xx}} - \frac{3}{2}\dot{x}\sqrt{x} - \frac{\dot{x}}{\sqrt{x}}$  is  $v - \frac{1}{3}x\sqrt{x} - 2\sqrt{x}$

( $xv$  being  $= \dot{x} \cdot \sqrt{\frac{x}{1-x}}$ ); hence the flu. of  $v\dot{x} - \frac{1}{3}x\dot{x}\sqrt{x} - 2\dot{x}\sqrt{x} = vx - \text{fl. } x\dot{v} - \frac{4}{3}x\sqrt{x} - \frac{2}{15}x^2\sqrt{x} = vx - \text{fl. } \frac{x - \frac{1}{2} + \frac{1}{2}\dot{x}}{\sqrt{x-xx}}$

$- \frac{4}{3}x\sqrt{x} - \frac{2}{15}x^2\sqrt{x} = \frac{x - \frac{1}{2}}{10+x} \cdot v + \sqrt{x-xx} - \frac{2}{15}x\sqrt{x} \times$

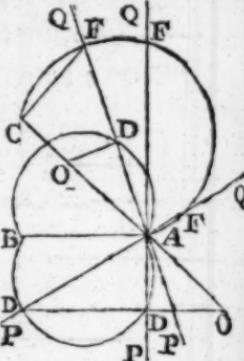
$10+x = (\text{when } x = \frac{1}{2}) \frac{1}{2} - \frac{1}{15}\sqrt{\frac{1}{2}} \times 10\frac{1}{2}$ ; which being multiplied by  $\frac{1}{2}x^{-\frac{5}{2}}$  or  $2\sqrt{2}$ , it becomes  $\sqrt{2} - \frac{7}{5}$ .

Ingenious answers were also given by the proposer, Mr. Clarke, and by Mr. John Fletcher.

## XII. Question 783 answered by Mr. Geo. Sanderson.

DRAW BA, CA, on which describe the segments ABD, ACF to contain the given angles; on CA, or CA produced as the case requires, take AO such, that  $AO \times AC = MN^2$ ; draw OD to make the  $\angle AOD =$  the angle which CF is to make with PQ, and meeting the circle BDA in D; through A, D draw PQ cutting the other circle in F, and the thing is done.

For the  $\Delta$ s ACF, ADO, having  $\angle O = \angle F$ , and angles at A equal or common, are similar; whence  $AD : AO :: AC : AF$ , and  $AD \times AF = AO \times AC = MN^2$ , as required.



The same by Mr. Rob. Bownas, of Bramley near Leeds.

**CONSTRUC.** Draw AB, AC, on which describe the segments ABD, ACF to contain the given angles. Draw either of the diameters AE, on which continued take AG such, that  $EA \times AG$  may  $= MN^2$ ; make GF  $\perp$  GE, and through its intersection F with the other circle draw the required line PAQ.

**DEMONS.** When DE is drawn, the  $\Delta$ s ADE, AGF will be similar;  $\therefore DA \cdot AF = EA \cdot AG = MN^2$ .

**NOTE.** It is evident, that when GF touches the circle, the rectangle is the greatest. And that when it meets it not, the prob. is impossible.

It was also constructed by Messrs. Amicus, Brinkley, Fletcher, Hartley, Moss, Parnel, and Saul. And neat algebraical solutions by Messrs. Dees, Horticultura, Reynolds, Rowe, and Terril.

XIII. Queit. 784 answ. by Mr. Rob. Phillips, of St. Agnes.

PUT the earth's radius CE or CB = 4000 miles

$= 21120000$  feet  $= a$ ,  $32\frac{1}{2}$  feet  $=$  the force of gravity  $= s$ , the distance CF of the body from the center at the end of any time ( $t$ )  $= x$ , and the velocity at F  $= v$ . Then, by the laws of attraction,  $a : s :: x : sxa^{-1}$   $=$  the force at F, and by the principles of motion  $v^2 = -sx^2a^{-1}$ , and taking the fluents  $v^2 = -sx^2a^{-1}$ ; but when  $v = 0$ ,  $x = a$ , therefore the correct fluent is  $v^2 = sa^{-1} \times a^2 - x^2$ , and hence  $v = \sqrt{sa^{-1}} \times \sqrt{a^2 - x^2} = \sqrt{sa^{-1}} \times FG$ , the velocity of the ball at F. And when  $x = 0$ , this becomes  $\sqrt{sa^{-1}} \times s \times AC$  the greatest velocity, or that at the center C, which is  $= 26064\frac{1}{2}$  feet per second.



Again, the fluxion of the time, or  $t$  is  $= -\dot{x}v^{-1} = \sqrt{sa^{-1}} \times -\dot{x} \times a^2 - x^2)^{-\frac{1}{2}}$ , and the correct fluent gives  $t = \sqrt{sa^{-1}} \times \text{circ.}$

are whose radius is 1 and cosine  $x \alpha^{-1} = \overline{as}^{-1} \times \text{arc, rad. } \alpha \text{ and cos.}$

$\frac{EG}{\sqrt{s \times AC}} =$  the time of describing EF. And when the ball

arrives at C, this becomes  $t = \frac{EB}{\sqrt{s \times CB}} = \frac{EB}{CB} \times \sqrt{\frac{CB}{s}} = \frac{EB}{CB} \sqrt{\frac{s}{s}}$

$= 2 \times .78539 \text{ &c. } \sqrt{\overline{as}^{-1}} = 127.82 \text{ seconds} = 21 \text{ m. } 12.82 \text{ s. the time of falling to the center.}$

**COROL.** Since any active force, acting in contrary directions, always generates or destroys an equal quantity of motion in the same time, it is evident that after the body passes the center, its velocity at all equal distances on either side will be equal; and when it arrives at the opposite surface, its velocity will be quite destroyed, and the body will again fall towards the center, and proceed till it arrives at the surface again; and thus it will oscillate forward and backward continually; and the whole time of a double oscillation, or of quitting E till it arrive at E again, will be quadruple the time above found for passing over the radius EC, and will therefore be  $2 \times 3.14159 \text{ &c. } \sqrt{\overline{as}^{-1}} = 1 \text{ h. } 24 \text{ m. } 51.28 \text{ s.}$

Other answers were given by Messrs. Fletcher, Horticultura, Latbam, Lean, Littlewood, Ja. Phillips, Reynolds, Terricola, Terril, and Todd.

#### XIV. Question 785 answered by Mr. Geo. Sanderlon.

**LEMMA.** If the point A in  $\overline{GkOAKICF}$  the right line GE be given, and it be required to find the points O and I, in GA and GE respectively, such that  $GA : AE$



$\therefore GO : EI$ ; I say the solid  $OI \times GO^2$  will be the greatest possible, when  $GO = 2AO$ . For  $GE : GA :: OI : OA :: OI \times GO^2 : OA \times GO^2$ , therefore when  $OI \times GO^2$  is a max.  $OA \times GO^2$  is so too, which by theor. 17 Simp. on the Max. and Min. is when  $GO = 2OA$ .

**CONSTRUC.** On GA the given sum of the differences, and AE the given perimeter, take Gk and AK each  $= \frac{1}{3}GA$ , also take EF  $= \frac{1}{3}AE$ ; on the diameter KF describe a semicircle, to which apply AD  $= Ak$  ( $AG - AK$ ) which continue to B, and from the center C draw CB; so is ACB the triangle required.

**DEM.** Take  $GO = 2Gk$  ( $2AK$ ), and  $EI = 2EF$ , draw CD, and the  $\perp CP$ . Then  $AD$  ( $AG - AK$ ) is manifestly  $= AP - PB$  (DP), and  $AF = AC + CB$ ,  $KA = AC - CB$ , and (by Eucl. Cor. III. 36, and VI. 14)  $AK$  ( $Gk$ ) :  $AB :: AG : AE :: Gk : FE$  by constr.  $\therefore AB = EF$ , and  $AC + CB$  ( $AF$ )  $+ AB = AE$  the given perimeter. Also the  $\triangle ACB$  is a max. for  $2AB$  ( $EI$ ) is to  $2AK$  ( $GO$ ) in the given ratio of AE to AG, therefore when  $\frac{1}{2}AB \times CP$  or the area of the  $\triangle ACB$  is a max.  $AK \times PC$  must be so likewise, and consequently  $2AK$  ( $GO$ )  $\times 2CP$  and  $GO^2 \times 4CP^2$  are so; but  $4CP^2 = 4CD^2 - 4DP^2 = FK^2 - DB^2 = FK + DB \times FK - DB$ ,  $\therefore GO^2 \times FK - DB$  is a max. because  $FK + DB = AE - AG$ , a given quantity, but  $FK - DB = AF - AB + AD - AK = OH$ , and by the lemma  $GO^2 \times OI$  is a max. when  $GO = \frac{2}{3}AC$ ,  $\therefore$  the  $\triangle ACB$  is a maximum. In the very same manner is the solution given by the proposer, Amicus,

who farther remarks, that in this triangle are given the sums of each side, and its adjacent segment of the base, which is the 743d Diary question.

The same by Mr. Nathan Parnel, of Nuneaton.

**I**F ABC be the triangle required, and ED the  $\perp$ ; then if  $AB + BC + AC = AB + BC + AD + DC$ , and  $AB + BC - AD - DC$  be given, the half sum and half difference of these two quantities are also given, that is,  $AB + BC$ , and  $AC$  are given, in which case (by Simp. Geom. p 198, theor. 5,) the  $\triangle$  will be an isosceles one when a max. and in this case I have omitted the construction, it being so well known.— But if  $AB + AD - BC - DC$  be given, instead of  $AB + BC - AD - DC$ , the construction will be as follows. Make  $EG = GF = \frac{1}{2}$  the given perimeter;  $DG = \frac{1}{2}$  the given sum of the two diff. of the sides, and of the segments of the base; and  $BD \perp EF$ , and of such a length that  $BD^2 = \frac{1}{2}ED \times DF$ ; then draw EB, BF; as also BA, BC making the  $\angle ABE = \angle E$ , and  $\angle CBF = \angle F$ ; and ABC will be the triangle required.—For by reason of the equal angles, we have  $AB = AE$ , and  $CB = CF$ ; consequently  $AB + AD = ED$ , and  $BC + CD = DF$ ;  $\therefore AB + BC + AC = AB + BC + AD + DC = ED + DF$ , the given perimeter; and  $AB + AD - DC = ED - DF = 2DG$ , the given sum; and (47 Euc. I. &c.)  $AB - AD = BD^2 \div DE$ , and  $BC - DC = BD^2 \div DF$ ; and consequently  $2AD = ED - BD^2 \div DE$ , and  $2DC = DF - BD^2 \div DF$ ; and because the  $\triangle ABC$  is a max.  $2AC \times BD = 2AD + 2DC \times BD = ED + DF - BD^2 \div ED - BD^2 \div DF \times BD = ED \times DF - BD^2 \times BD \times ED + DF \div ED \times DF$  is a max. and since ED and DF are given,  $ED \times DF - BD^2 \times BD$  is evidently a max.  $\therefore$  (by Simp. Geom. pa. 208, theor. 18,)  $ED \times DF - BD^2 = 2BD^2$ , or  $BD^2 = \frac{1}{2}ED \times DF$ , as by constr.

**N**O T. The above contains a solution to the 743d Diary question.

Conf. were also given by Messrs. Brinkley, Clarke, and Horticulture. And algebraic solutions by Messrs. Dees, Fletcher, Latham, Lean, Patterson, Ja. Phillips, Reynolds, Robinson, Rowe, Saul, Terril, White, Whitton, and W. Williams; from whence it appears that the sides of the triangle are in arithmetical progression.

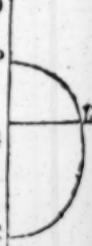
#### XV. Question - 86 answered by Amicus.

**I**F OS be the axis of a cylinder, the radius of whose base O is  $= r$ , it is proved by writers on this subject, that when it is suspended at one end O, the distances CO and CG from P the center of oscillation C to the point of suspension O, and to the center of gravity G, will be respectively

$$\frac{4OS^2 + 3r^2}{6OS} \text{ and } \frac{OS^2 + 3r^2}{6OS}. \text{ And when it is suspended}$$

at any other point P, we have  $PG : OG = \frac{1}{2}OS ::$

$$\frac{OS^2 + 3r^2}{6OS} : \frac{OS^2 + 3r^2}{12PG} = GC, \text{ the distance of the cen-} S$$



ters of gravity and oscillation when it is suspended at P; and erecting GL  $\perp$  OS so that  $12 GL^2 = OS^2 + 3r^2$ , and with the center in OS through the points P and L describing a semicircle, its diameter PC = PG + GL  $\div$  PG will be the length of an isochronous pendulum, and will evidently be a minimum when GL = GP = GC = the radius of the circle.

The same by Plus Minus, the Proposer.

LET BD be the given cylinder, P the given point of suspension in the axis BD. Bisect BD in A; produce it also to R, which suppose to be the center of oscillation when P is the point of suspension; then will P be the center of oscillation if R be the point of suspension. And if you call BD,  $a$ ; AP,  $x$ ; BR,  $z$ ; and the radius of the cylinder's base  $r$ ; you will have, by p. 238 Emerson's fluxions, PR =  $\frac{12z^2 + 12az + 4a^2 + 3r^2}{12z + 6a} = x + \frac{1}{2}a + z (= AP + AB + BR)$ , consequently  $z = \frac{a^2 + 3r^2 - 6ax}{12x}$ ; and  $z + x + \frac{1}{2}a (PR) = x + \frac{1}{2}a + \frac{a^2 + 3r^2 - 6ax}{12x} = \frac{12x^2 + a^2 + 3r^2}{12x} = y$  (PM). Or  $12xy - 12x^2 - a^2 - 3r^2 = 0$ .

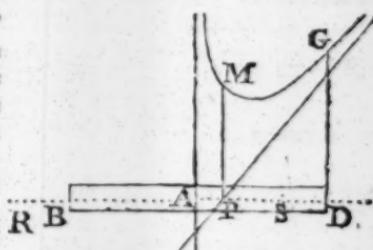
The hyperbola, which is the locus of this equation, is constructed by drawing two indef. right lines through A, one  $\perp$  AD, the other at an  $\angle$  of  $45^\circ$ , for asymptotes; and then drawing DG  $\perp$  AD cutting one asymptote, and  $= \frac{2}{3}a + \frac{1}{2}r^2 a^{-1}$ ; then thro' G descr. the opposite sections.

Every ordinate of these hyperbolas is the length of a pendulum, whose vibrations are isochronous to the vibrations of the cylinder, when the point, which is the foot of that ordinate, is its point of suspension. The above equation of the hyperbola being reduced, gives  $x = \frac{1}{2}y \pm \frac{1}{2}\sqrt{y^2 - r^2 - \frac{1}{3}a^2}$ , and the ordinate ( $y$ ) being a minimum when the two values of the abscissa become equal, in that case we shall have  $x = \frac{1}{2}y$ , and  $\sqrt{y^2 - r^2 - \frac{1}{3}a^2} = 0$ , or  $y = \pm\sqrt{r^2 + \frac{1}{3}a^2}$ , and consequently  $x = \pm\frac{1}{2}\sqrt{r^2 + \frac{1}{3}a^2}$ . If then you take AS = this value of  $x$ , S will be the point of suspension when the vibrations of the cylinder are made in the shortest time. And in this case the point of suspension and center of oscillation are equidistant from A, the middle of the axis.

Solu. were given by Messrs. Fletcher, Hartley, Horticultura, and Terril.

XVI. (or Pr.) Quest. 787 answ. b P. Puzzlem, the Proposer.

LET  $b$  be the angular velocity of the parabola about its axis, measured at the distance  $r$  therefrom;  $v$  the velocity of the projectile from, and  $v$  the velocity parallel to the axis;  $f$  the force towards, and  $b$  the force parallel to the same axis; and  $g$  the force at right angles to the plane of the parabola.



Then, by LANDEN's IXth Mathemat. Memoir,  $f$  will be =  $\frac{b^2 y \dot{y} - r^2 v \dot{v}}{r^2 \dot{y}}$ ,  $g = \frac{2 b v}{r}$ , and  $b = \frac{v \dot{v}}{\dot{x}}$ ; where  $v : v :: \dot{y} : \dot{x}$ .

Now,  $4rx = y^2$  being the equation of the parabola,  $f \cdot \sqrt{x-r} + by$ , the force at right angles to the ray from the focus, by the quest. must be

= 0; and therefore the force towards the focus, or  $\frac{fy + b \cdot r - x}{r + x}$ ,

will be  $= \frac{r - x^2 + y^2}{r^2 - x^2} + b$ . Moreover, by substituting properly in

the equation  $f \cdot \sqrt{x-r} + by = 0$ , we get  $v \dot{v} + \frac{2v^2 y \dot{y}}{4r^2 + y^2} = \frac{b^2 y \dot{y}}{r^2} \times$

$\frac{4r^2 - y^2}{4r^2 + y^2}$ : whence  $v = \frac{b}{r} \times \frac{\sqrt{k + 16r^4 y^2} - \frac{1}{3}y^6}{4r^2 + y^2}$ , where  $a$  and  $c$

are contemporary values of  $y$  and  $v$ , and  $k = c^2 r^2 b^{-2} \cdot \frac{4r^2 + a^2}{4r^2 + y^2} - 16r^4 a^2 + \frac{1}{3}a^6$ . The value of  $v$  being thus found, the value of  $v (= \frac{1}{2}vyr^{-1})$  will be known; and consequently the force  $g$  and the force towards the focus, of which the required force will be compounded.

Putting  $w$  for  $4r^2 + y^2 \div 4r$ , the focal distance;  $t$ , the flux. of the time, will be  $= \frac{\sqrt{3 \cdot rwvw}}{2b\sqrt{w-r}, \sqrt{K+3rw^2-w^3}}$ ,  $K$  being =

$\frac{3k}{64r^3} - 2r^3$ : the fluent of which fluxion will, in some cases, be asigned by the arcs of the conic sections. See the Append. to LANDEN's Math. Memoirs.

REMARK 1. If  $k$  be = 0, the body, either immediately, or some time after it is put in motion, will continually approach nearer and nearer to the vertex of the parabola, yet never can arrive at it!

REMARK 2. If  $k$  be positive, the body will pass and repass through the vertical point, and its recess therefrom will be limited by a circle, to whose plane the axis of the parabola will be perpendicular, and whose radius will be the positive root ( $y$ ) of the equation  $y^6 - 48r^4 y^2 - 3k = 0$ ; which circle will touch the trajectory at each apsis.

REMARK 3. If  $k$  be negative, the trajectory will be situated between, and limited by, two circles, to each of whose planes the axis of the parabola will be perpendicular, and the radius of each will be a positive root of the equation  $y^6 - 48r^4 y^2 - 3k = 0$ ; which circles will touch the trajectory, the one at the apsides nearest to the vertex of the parabola, and the other at the apsides most remote from the said vertex.

Ingenious solutions were also given by Amicus, and Mr. Rob. Phillips.

The Geom. Paradox, answ. by C. Bumpkin, the Proposer.

THE following very remarkable inference, not adverted to by Sir Isaac

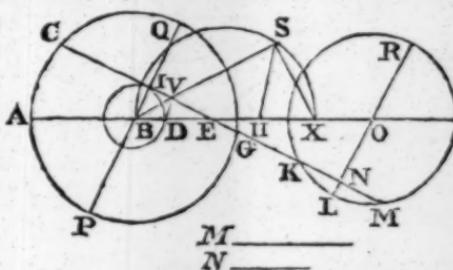
Newton, may be deduced from prob. 19 of the 1st Edit. of his Algebra; viz. the solid in the form of an Apothecary's mortar, generated by any conic hyperbola, revolving about its conjugate axis, may also be

generated by a right line having a certain inclination to the plane of that hyperbola, and revolving therewith about that axis! — and, by that problem, the position of the generating right line may be ascertained, which will clearly prove the truth of the paradox.

By mistake last year, wrong solutions to questions (VIII.) 764, and (XII.) 768, were handed to the Printer, instead of which they should have been as follows, by the same gentleman, Mr. Henry Clarke.

### VIII. Question 764 answered.

**C**ONSTR. Let the given ratio of  $CG$  to  $KM$  be that of  $M$  to  $N$ ; and  $E$  the given point thro' which  $CM$  is to pass. Make  $BX : BE :: EO : M$ , and describe the semicircle  $BSX$ , in which apply  $XS = N$ , and join  $S, B$ . Take  $Q^2 = M \times OR$ , and  $R^2 = N \times BP$ , also take

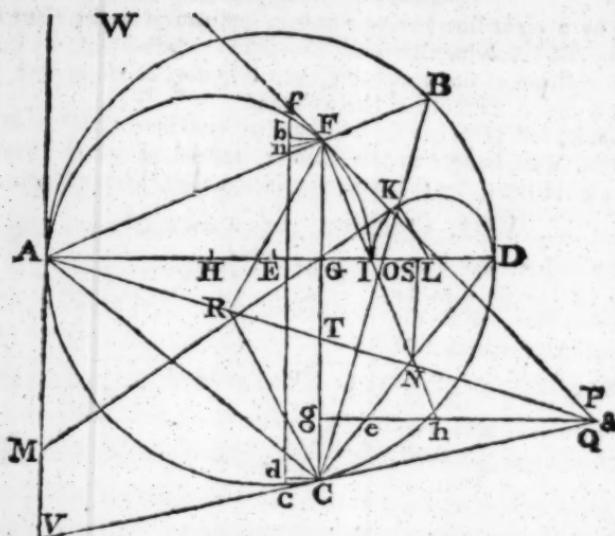


$BH, BV$  such that  $BH^2 = Q^2 + R^2$ , and  $BV^2 = Q^2 - R^2$ . Join  $S, H$ , and draw  $VD \parallel SH$ , then with center  $B$  describe the circle  $DI$ , to which through the given point  $E$  draw the tangent  $CLM$ , and it is done.

**D**EMONSTR. For by sim.  $\Delta s$ ,  $BS : BH :: BV : BD$ , that is (from the construc. and Eucl. I. 47.)  $BX^2 - N^2 : Q^2 + R^2 :: Q^2 - R^2 : BD^2$ , or  $BX^2 - N^2 : OR \cdot M + BP \cdot N :: OR \cdot M - BP \cdot N : BD^2$ ; hence by compos. &c.  $M^2 \cdot OR^2 - BX^2 \cdot BD^2 : M^2 \cdot BP^2 - BD^2 :: N^2 : M^2$ . Now, by constr.  $BE : EO :: M : BX$ , and by exposit.  $BE : EO :: BD : ON$ , ex aequali  $BD : ON :: M : BX$ ; hence  $M^2 \cdot OR^2 - ON^2 : M^2 \cdot BP^2 - BD^2 :: N^2 : M^2$ , or  $OR^2 - ON^2 : BP^2 - BD^2 :: N^2 : M^2$ . But  $OR^2 - ON^2 = RNL = KN^2$ , and  $BP^2 - BD^2 = PIQ = GI^2$ , by Euc. III. 35, and exposit.  $\therefore KN^2 : GI^2 :: N^2 : M^2$ , or  $KM : CG :: N : M$ .

### XII. Question 768 answered.

**A**NALYSIS. Suppose  $ABC$  to be the required greatest triangle inscribed in the given circle  $ABDC$ , and having its two sides  $AB, AC$  in the given ratio. Draw the diam.  $AD$ , its center being  $E$ , and  $CF \perp AD$ ; then  $\Delta ACF$  is evidently sim. to  $\Delta ABC$ , and having the side  $AC$  common,  $ACF$  will be a maximum when  $ABC$  is a max. but when a triangle, as  $ACF$  is a max. the base and perpendicular are to each other directly as their increments or decrements, namely,  $AG : CF :: AG' : CF'$ . With center  $H$  in  $AD$ , suppose a semicircle  $AFI$  drawn through  $A$  and  $F$ , (the diam.  $AI$  of which will be given, since  $AI : AD :: AF : AB :: AC^2 : AB^2$  in the duplicate of the given ratio) and suppose  $cf$  to be indefinitely near to  $CF$ ,  $Cd$  and  $Fb \parallel AG$ , and  $Fn \parallel Cc$ ; then  $Cd$  or  $Fb$  is the decrement of  $AG$ , and  $fn = fb + cd$  is the increment of  $CF$ ;  $\therefore AG : CF :: Fb : fn ::$  (by drawing the tangents  $Ca, Fa$ , forming the  $\Delta CaF$  sim.  $\Delta nFf$ , and drawing  $ag \parallel AG$  or  $\perp CF$ )  $ag : CF$ ; and as the consequents are the same  $CF$ , the antecedents  $AG, ag$ , are equal. So that the problem is now reduced to this, Dividing  $AD$  in



I in the duplicate of the given ratio, and describing the semicircle AFI, to find the point G so, that drawing CGF  $\perp$  AD, and the tangents Ca, Fa, and ag  $\parallel$  AG, then ag may be  $\equiv$  AG.

Now the point G will be found so as to answer this condition, by describing the semicircle IKD on the diam. ID and center L, then taking  $\text{AM} \perp AD$  and  $= 3 IL$ , and drawing MGK to touch IKD in K.— For, draw FINh and CeND, also AN, producing it to meet the tang. Fa in P, and tang. Ca in Q; bisect AN in R, and join RF, RC; also on GD take GS  $\equiv$  GK, and join NS. Because ACN and AFN are right angles, R is the center of a circle passing through the points A, F, N, C; but the same circle passes through S, (because  $GA \cdot GI = GF^2$  (Euc. 8, 6) and  $GD \cdot GI = GK^2$  (37.3)  $\equiv GS^2$ ,  $\therefore GF^2 : GS^2 :: GA : GD :: GA^2 : GA \cdot GD = GC^2$ ,  $\therefore GF : GS :: GA : GC$ , and  $GF \cdot GC = GA \cdot GS$ ), and as AN is the diameter of it, S is a right angle, and AGT, ASN sim.  $\Delta$ s; but, by constr.  $AM = 3KL$ ,  $\therefore AG = 3GK = 3GS$ , and  $AT = 3TN$ ,  $AN = 4TN$ ,  $RN = 2TN$ , and  $TR = TN$ . But  $\angle IFP = IAF$  (32.3)  $\equiv IFT$  (32.1) and  $RFT + IFT$  (NFT)  $\equiv RNF$  (5.1)  $\equiv NFP$  (NFG)  $+ NPF$  (32.1),  $\therefore NPF = RFT$ ; and the  $\angle R$  is common,  $\therefore$  the  $\Delta$ s RFT, RFP are equiangular; but  $RF(RN) = 2RT$ ,  $\therefore RP = 2RF$  or  $2RN$ . In the very same manner, because CQ is a tangent to the circle ACD, it is proved that  $RQ = 2RN$ . Consequently P and Q both coincide with a;  $\therefore Ra = AN$  (2RA), and  $TA = Ta$ ; and hence, by sim.  $\Delta$ s,  $GA \equiv ga$ .

SCHOL. Many curious properties are easily drawn from what has been done above; such as that  $AO = 3DO$ , or the base  $CB$  of the greatest  $\triangle ABC$  always passes through the same point  $O$  in the diam.  $AD$  as the inscribed equilateral triangle having the same vertex  $A$ , whatever be the given ratio of  $AB$  to  $AC$ ; that the parts  $ge$ ,  $eh$ ,  $ha$  are respectively  $= GE$ ,  $EH$ ,  $HA$ ; that the greatest  $\triangle AFC$ , having its vertex in  $A$ , and base  $FC \perp AD$  and terminating in the two given semicircles  $AFI$ ,  $ACD$ ,

will be when the two tangents  $aFW$ ,  $aCV$ , terminated by  $VMAW \perp AD$ , are bisected in the points of contact  $F$ ,  $C$ ; &c.

A fluxionary solution to the same.

PUT  $AG = x$ ,  $AI = a$ , and  $AD = d$ ; then  $CF = \sqrt{ax - x^2}$ , and  $GC = \sqrt{dx - x^2}$ ; consequently  $x\sqrt{ax - x^2} + x\sqrt{dx - x^2} = a \max.$  the fluxion of which made = 0 gives  $8x^2 = 9x \cdot a + d - 9ad$ ; subtract each side from  $9x^2$ , so shall  $x^2 = 9 \times x^2 - x \cdot a + d + ad = 9 \cdot a - x \cdot d - x = 9GI \cdot GD = 9GK^2$ , hence  $x = AG = 3GK$ , and consequently  $AM = 3KL$ , as before.

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### NEW QUESTIONS.

I. QUESTION 788 by Mr. Wm. Swift, of Stow, near Lincoln.

R EQUIRED the value of  $x$  as below \*,

And you will oblige your most humble at Stow.

\* By a quadratic, supposing  $x^4 - 2x^3 + x = a$ .

II. QUESTION 789 by Mr. Paul Sharp, of Biddenden.

**I**N 56 deg. 19 m. 38 s. north latitude, the sun's amplitude was observed to be 26 deg. 34 m. more than his altitude at 6 o'clock: Required the said amplitude, altitude, and the day when the observation was made.

III. QUESTION 790 by Mr. Tho. Robinson, of Biddick.

GIVEN the diameters of the circles circumscribing and inscribed in a parabola, equal to 10 and 8; to find the parabola.

IV. QUESTION 791 by Master John Brinkley, at Harlston.

FROM a given point A to draw two right lines AB and AC to meet a right line PQ given in position, so that the rectangle under AB and AC may be of a given magnitude, and the angles ABC and ACB have a given difference.

V. QUESTION 792 by Mr. Rob. Phillips, of St. Agnes.

R EQUIRED the area of a curve whose equation is  $y = x^{\frac{1}{2}} \times \text{hyp. 1.}$

$\frac{a+x^{\frac{3}{2}}}{a-x^{\frac{3}{2}}}$ , supposing that when  $y = 0$ ,  $x$  is = 0.

VI. QUESTION 793 by Lieut. Glenie, of the Engineers.

**I**N any rectilineal triangle ABC, if any one (AB) of the sides be assumed, to determine a point P, through which if a right line be drawn parallel to that side, the difference of the parts of this line and the perpendicular distance of P from the assumed side, shall have to each other, the duplicate ratio of the parts themselves.

VII. QUESTION 794 by Mr. Michael Taylor.

T O determine a place on the earth, where a degree of the meridian is equal to a degree of the equator; the ratio of the axis to the equatorial diameter being that of 229 to 320.

## VIII. QUESTION 795 by Amicus.

**G**IVEN the difference of the sides, the line drawn from the vertex to bisect the base, and the ratio of the difference of the segments of the base to the diameter of the circumscribing circle; to construct the triangle.

## IX. QUESTION 796 by Nauticus.

**H**AVING given the right ascension and declination of any fixed star, it is required to determine the greatest and least right ascensions that another star can have, whose declination is given, so that it may be seen on the same vertical circle with the former, in a given latitude.

## X. QUESTION 797 by Mr. Alex. Rowe, of Reginnis.

**R**EQUIRED the nature and quadrature of the curve into which a flexible wire 113052 feet long must be bent, so that a ring of heavy metal being put thereon and the wire revolved about an axis at right angles to the horizon, with a given velocity, the said ring shall rest in equilibrio; the abscissa being to the ordinate as 3 to 2.

## XI. QUESTION 798 by Mr. Nathan Parnell.

**F**ROM two given right lines it is required to cut off two equal parts so, that the two remainders may be to each other as the squares of the whole lines respectively.

## XII. QUESTION 799 by Mr. Rob. Hartley, of Daresbury.

**S**UPPOSE a field in form of a semi-parabola, whose abscissa is 9 chains, and semi-ordinate 6 chains; and let the land along the ordinate be worth after the rate of 100 pounds an acre, and from thence uniformly to decrease along the abscissa in such a manner, that every equal part of any one semi-ordinate may be of the same value, so as to be worth 60 pounds an acre at the vertex: It is required to divide the said field into two equivalent parts by a line drawn parallel to the abscissa; and to determine the mean price per acre of the whole field.

## XIII. QUESTION 800 by Mr. Geo. Sanderson.

**G**IVEN the sides AC and CB, and the product of the base AB and cube of the perpendicular CD a maximum; to determine the triangle ACB by an equation not exceeding a quadratic, and to construct the triangle.

## XIV. QUESTION 801 by Terricola.

**L**ET A, B, C, D be given points in a vertical line, A the highest, and the rest in succession; and let CE, DF be horizontal lines; then, F being a given point in DF, it is required to find E in CE so that, joining BE, EF, if a heavy body fall freely from A to B, and be then deflected along the plane BE, and thence from E to F along the plane EF, the time of descent to the lowest point F may be the least possible; supposing its motion not to be impeded by striking the planes at B and E.

## XV. OR PRIZE QUESTION 802 by Plus Minus.

**B**Y observing the interval of time between two observations, one of two fixed stars on the same azimuth circle, the other of two other fixed stars (or even of the same two stars when that is possible) on the same azimuth circle, the latitude of the place of observation may be determined. It is required to shew how the observer may chuse his star, that the error in the latitude, caused by that which he is liable to commit in judging when the stars are on the same azimuth circle, may be the least possible.

\* \* \* The prizes have been determined by lot as follows. First, for the solution of the prize question, to Mr. Peter Puzzard 12, and to Amicus 8 diaries.---2dly, for the solution of the prize enigma, to Mr. Phil. Williams 10, and to Mrs. Rubwell 8 diaries.---3dly, for the general solution of the enigmas, to Miss E. Cooke 10, and to Mr. Rob. Hartley 10 diaries.---4thly, for the solution of the queries, &c. to Mr. John Bayley 8, and to Mr. Wm. Turner 8 diaries. All of whom will please to order them to be called for at Stationers-hall, London.---All Letters for the use of the Diary must be directed thus, "For the Ladies' Diary, Stationers-hall, London."---The gentleman who sent the question concerning the greatest rectangle in a quadrant will please to observe, that it is not a new one, though doubtless he thought it was. We sent a letter to apprise him of it, but it came back to us, the post not being able to find him, which is the reason of the alteration he may observe.---He will please to send us his proper address.

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